



State of the art of fisheries co-management : synthesis report .

Jean-Yves Weigel

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COMMISSION SOUS-RÉGIONALE DES PÊCHES
SUB-REGIONAL FISHERIES COMMISSION



State of the art
of fisheries

CO-MANAGEMENT

February 2013

SYNTHESIS REPORT

Cape Verde

Mali

Senegal

The Gambia

Guinea-Bissau

Guinea

Sierra Leone





Authors

Jean-Yves Weigel (IRD) and David de Monbrison (BRLi)

Coordinator

David de Monbrison (BRLi)

Contributors

Alexis Fossi (BRLi), Yan Giron (Armeris), Christophe Breuil, Yannick Carteret, Pablo Chavance (IUCN), John Chouinard, Hamady Diop (SRFC), Mohamed Lemine Ould Tarbiya, Bozena Stomal (RESED), Elisabeth Tempier and Philippe Tous (Oceanic Development/SRFC)

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INTRODUCTION

1.1 Co-managed fisheries: a topical issue for the SRFC area

Current interest in fisheries co-management is first of all a reflection of the failure of conventional fisheries management against a background of declining income from fishing and increasing conflicts over the exploitation of re-sources. Already in the nineties, a global study on the transition towards sustainable fishing based on twenty five case studies emphasised the success of fisheries co-management (OECD, 1997).

Governments and development agencies have promoted numerous fisheries co-management programmes from the end of the 1990s. In the developing countries, which include the countries within the area of the Sub-Regional Fisheries Commission (SRFC), most co-management provisions were introduced at the initiative of the donors and implemented by the international or local NGOs. The most visible part of these co-management programmes is the building of local organisations of fishers and other stakeholders, and changes to the legal, institutional and administrative framework, as co-management is included in numerous fisheries codes or strategic plans of the countries in the region.

Promotion of co-management went hand in hand with the decentralisation of development aid, in the SRFC countries, as in all the developing countries recipients of international aid. To the conventional centralised forms of development aid distribution through governmental or quasi-governmental bodies, the donors sought to substitute decentralised forms achieved through promoting co-management.

The reshaping of the institutions, a prerequisite for formulating and implementing co-management, was and remains shackled, especially in developing countries, by incomplete decentralisation and the reticence of the States to grant local authorities their own fiscal resources (Féral, 2007; Cazalet, 2007). Most of the time, therefore, we have an administration with limited human and financial resources on the one hand, and local authorities not assigned the necessary resources to develop cooperative of producers or grassroots organisations, on the other.

On a transnational or transboundary scale, co-management is justified by the large volume of shared stocks and the amplitude of the migratory flows of fishing resources and fishers, particularly within the SRFC area. Several projects have been developed on these dimensions over the past few years in the SRFC countries, including, for example, the project on “Regional policies on sustainable fisheries of small pelagic fish stocks in Northwest Africa” (SRFC, 2007a), the “Support project to the Management of Small-scale Transboundary Fishing” (PARTAGE), the component relative to regional processes and frameworks for understanding and dealing with the priority transboundary problems of the Canaries Current Large Marine Ecosystem protection project.

However, co-management has been widely used to justify participatory programmes which, in terms of fisheries management, do not correspond closely enough to the principal stakes and have not acted on the necessary levers for better management. The players concerned are therefore led to ponder several questions including; the contents of co-management in the face of certain abuses relative to the use of the term; how a management system evolves towards co-management; and the scales of co-management and their interactions (from local to transboundary). In the light of this situation, an overview of the literature on fisheries co-management was considered a useful tool to have in 2013, to see what lessons can be learnt.

☞ *At the same time, there has been renewed interest in traditional systems of fisheries co-management: the fishers' corporations (prud'homies) in the French Mediterranean, the Lofoten islands fisheries, the Cofradias in Catalonia, the Van Chai system in Vietnam, the Panchayat village system from Andhra Pradesh. Some of these older systems are only on the fringes of co-management proper, which evidences the wide spectrum covered by co-management in the fishing literature.*

1.2 An international analysis around key issues in fisheries co-management

This state-of-the-art on fisheries co-management was produced using a specific approach combining an in-depth analysis of the literature, illustrated by the boxes, and the leveraging of co-management experiences in different countries. To this end, skilled researchers and consultants from a wide range of backgrounds were brought together, who, having monitored the processes, countries and stakeholders concerned over long periods of time, capitalised on their critical and operational perspective to draw the lessons that can be useful to the SRFC countries. These international examples are presented in the technical report through a dozen experience sheets illustrating different types of co-management, the place of co-management in the whole set of functions associated with fisheries management, the different scales of co-management (local, national, transboundary) in Africa (Benin, Burkina-Faso, Guinea-Bissau, Madagascar, Mauritania and Senegal), in Asia (Indonesia, Japan, Thailand) Canada and France. Collective, inter-disciplinary work, drawing on knowledge of the SRFC zone, made it possible to highlight certain lessons, but also to formulate points for consideration which could be used as recommendations adapted to fisheries co-management in the region covered by the SRFC.

This work was coordinated by BRLi, and carried out by experts and researchers from BRLi, Armeris and IRD, backed by experts from the SRFC and numerous international contributions. Three main documents were produced:

- a technical report presenting the state of the art in fi-

sheries co-management;

- this "Synthesis report", which is a synthesis of the "technical report";
- a ten-page summary containing the principal conclusions of the study.

The first part of this report is devoted to the definition and classification of co-management on its various scales, then to the development and adaptation of co-management. Part two deals with drivers of co-management, the costs and benefits, tools for assessing co-management potential, key success factors and major hurdles, the principal conditionalities governing co-management as part of the management of fisheries (decision-making cycles and processes, sharing of functions, design and development, implementation, technical measures, transboundary and transnational co-management, integration of co-managed fisheries and Marine Protected Areas, co-management applied to artificial reefs and fish-aggregating devices). The third and final part draws lessons from the dozen or so international experiences that have been subject to in-depth analysis (cf. technical report).

This document will serve as a foundation for a regional symposium on fisheries co-management to be organised by the SRFC in 2013, to enable a comparison of perspectives, enhance the discussions of the institutions and concerned stakeholders, determine the major challenges for the States in terms of co-management and the sustainable management of the region's fishing resources. One of the specific challenges will be to leverage this work to enhance coordination between local, national and regional governance.

☞ *Several major questions related to the co-management of fisheries are broached in this study:*

- *What are the terms of reference that would allow adequate intervention of each stakeholder in a co-management system, at the level of the different phases and various scales (local, national, transnational)?*
- *What is the relative importance of the social, economic, institutional and legal aspects of co-management, respectively?*
- *What are the key factors for success or failure of fisheries co-management?*
- *What are the main components of conditionality for co-management in terms of framing, capacity building, data and tools?*
- *Are the costs of co-management higher or lower than other, more centrally-managed systems?*
- *What lessons drawn from international experience can be applied to the SRFC region?*

Map 1 Map of the co-management experiences considered in the study



Co-Management at local level

Co-Management at national level

Co-Management at the transnational level

* Other countries and co-management experiences mentioned in the study :
Co-Management and ITQ, FADs, MPAs, transboundary management, technical measures, etc.)

1.4 An analysis integrating the regional context of the SRFC

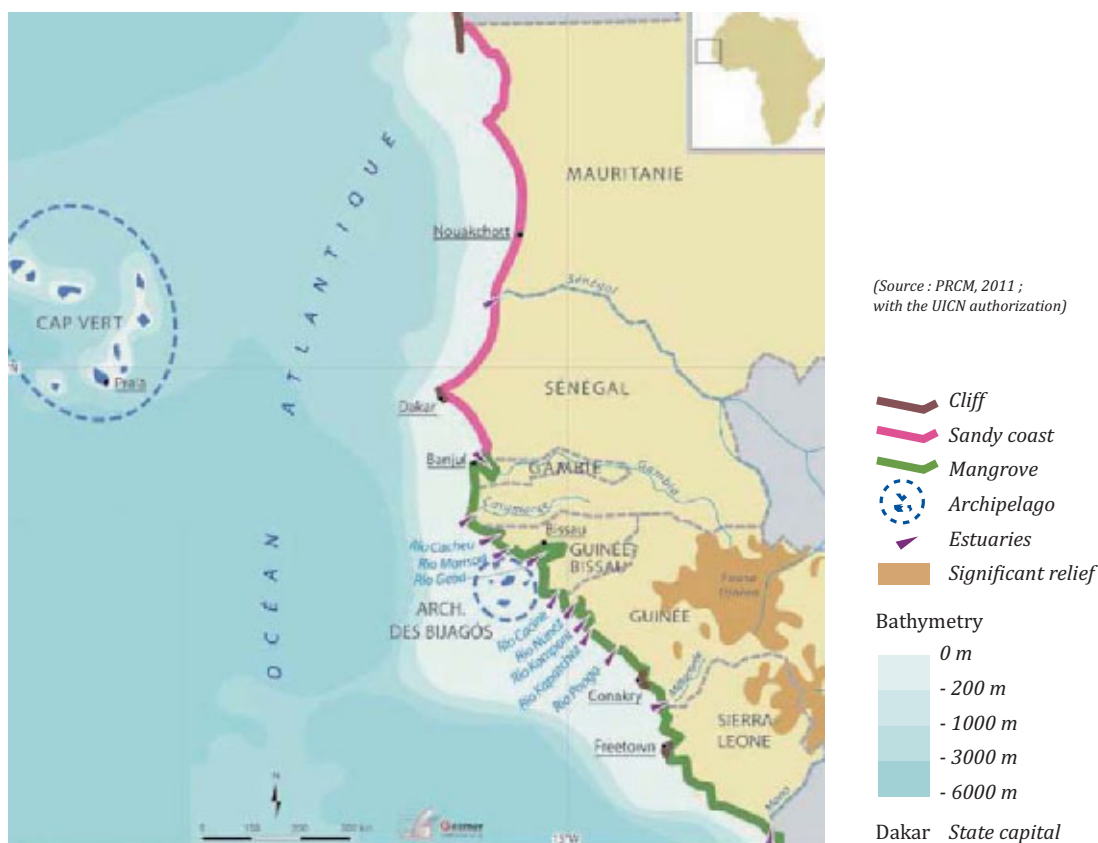
For a clearer understanding of the actions to be undertaken at the level of the SRFC region, the analysis of the literature and selected examples of co-management took into account the principal characteristics of this region, that is to say:

- A fisheries sector that is critical for society and the economy, characterised by the coexistence of local and regional artisan fisheries (often with a system of free access) and industrial fisheries (predominantly foreign), where the stakes are major in terms of food security, direct and indirect jobs, added value and exports.
- Relatively ineffective governance due to the inadequacy of the conventional approach to fisheries management, a lack of financial stability and sustainability, incomplete decentralisation, the weakness of State services and a fragmented civil society. These weaknesses hamper the regulation of access to resources for an oversized fishing capacity.

■ An environment that is highly productive but undergoing constant deterioration: the SRFC region comprises one of the four major upwelling zones on the planet, as well as an area covered in estuaries and mangroves, which explain the extraordinarily rich productivity (figure 1). However, studies of the Large Marine Ecosystems (LME) confirm the steady and continuous depletion of fisheries stocks on a regional scale, some of which are overexploited.

■ Fisheries resources that are varied, and migrations: the region comprises intermediate populations of temperate species and with tropical affinities. Certain stocks of pelagic fish have very marked migratory behaviour, which explains the seasonal movements of certain fishing communities, on both a national and transnational level. The amplitude and plurality of migration flows makes fisheries management more complex.

Map 2 The area and ecological zones covered by the SRFC and its seven member countries



2 DEFINITION, CLASSIFICATION AND ADAPTATION OF CO-MANAGEMENT

2.1 Definition and classification of co-management

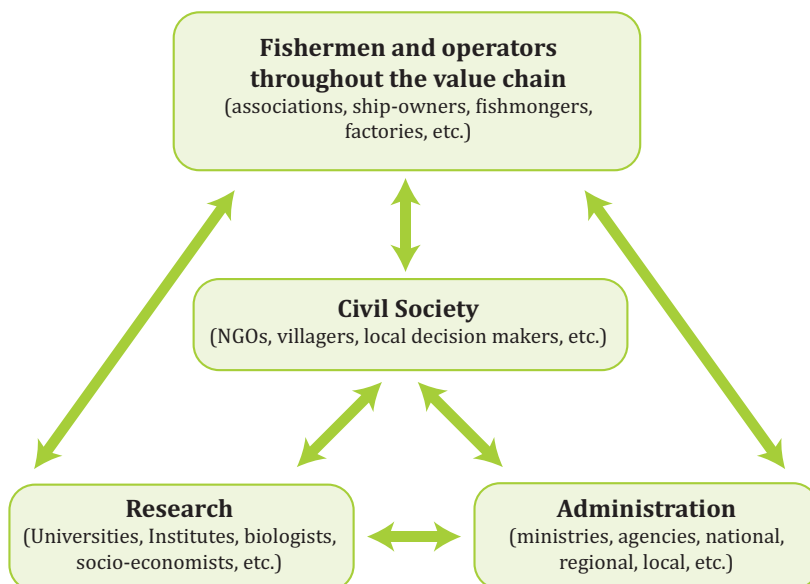
The idea of fisheries co-management emerged after that of development (aménagement) or management and prior to that of governance (Weigel, 2011). Starting from the end of the 1980s, the notion of co-management began to develop, analysis frameworks were proposed and arrangements discussed (Kearney, 1984; Jentoft, 1989; Pinkerton, 1989; Acheson, 1989; Feeny et al, 1990; Oakerson, 1992).

Co-management involves different players and the development of arrangements enabling their interaction; co-management is above all a process framed by arrangements, the success of which depends on the various aspects of conditionality described below (cf. section 3.5).

☞ *Fisheries co-management can be defined as the negotiated sharing of responsibilities between government agencies and groups of users or stakeholders, on condition that it induces:*

- *Negotiation and approval of management decisions by the communities or fishers' organisations, government agencies and other stakeholders,*
- *A set of arrangements defining responsibilities and decision-making powers enshrined in a formal agreement.*

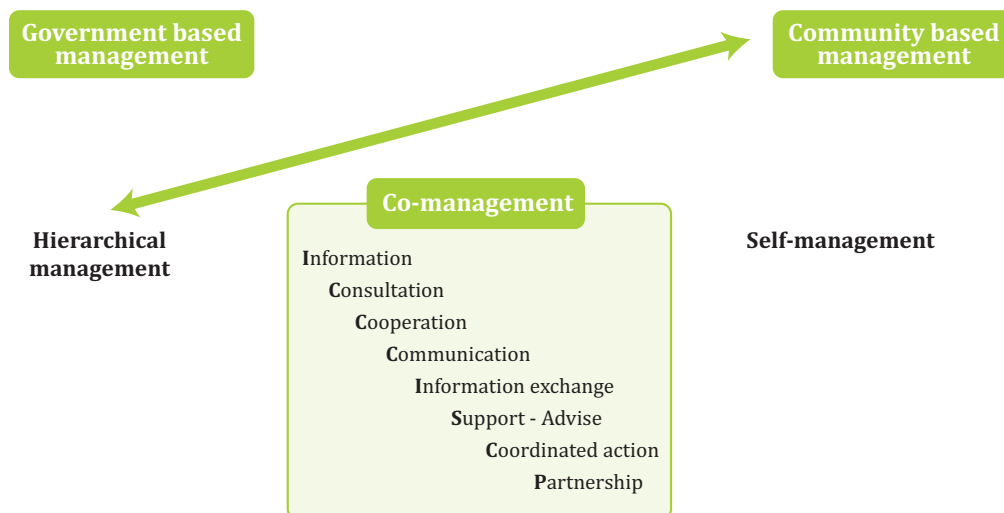
Figure 1 The main partners and key players in fisheries co-management (according to Alexis Fossi and Staples and Funge-Smith, 2009)



The different types of co-management refer to the different degrees of power sharing recognised in government agencies and users' groups or other stakeholders. Co-management therefore covers a broad spectrum from co-management leaning towards centralised government-based

management to co-management leaning towards community-based management, via simple cooperative management (Mac Goddwin, 1992; Allison and Ellis, 2001; Allison and Horremans, 2006) (fig.2)

Figure 2 The co-management spectrum: from government-based to community-based management (according to Berkes et al, 2001)



The broad spectrum of types of co-management explains why there are seven main types of co-management promoted in the literature (McCay, 1993; Berkes 1994; Sen and Raakjaer Nielsen, 1996; Raakjaer Nielsen et al. 2002):

- *instructive co-management* is characterised by a minimum of exchanges between user groups and the government agencies which impose decisions and inform the groups of planned decisions through dialogue facilitations
- *consultative co-management* describes a situation where the government, while reserving large areas for consensus, remains the decision-maker even though user groups have been involved in the process
- *cooperative co-management* describes the situation where government and user groups treat each other as equal. A small number of shared stocks is managed under this type of co-management
- *advisory co-management* implies that the user groups advise the government on the decisions to be taken, and the government takes this into account or approves the decisions
- *informative co-management* involves delegation of the government's power to the user groups who nonetheless have the duty and responsibility of informing the government of the decisions they make
- *instrumental co-management* describes a situation where the user groups are only involved in implementing the measures decided upon by the government, which avoids institutional reform
- *empowerment co-management* places the government and users groups on the same footing both for defining the management objectives and identifying the knowledge required for decision-making. This type of co-management is a learning process for all the parties involved.

2.2 The development and adaptation of co-management

One type of co-management may evolve over time, with the introduction of new stakeholders, for example, which changes the respective roles of the players involved. How a type of co-management evolves can be represented by schematising the arrival of new stakeholders (NGO, the media or the courts) and changes concerning the relative importance of the different stakeholders with, for example, greater or lesser involvement of the role of the scientific community (Garcia, 2011) (figure 3).

The adaptation of co-management refers to the idea of adaptive co-management developed in the case of renewable natural resources, including fisheries resources, or socio-ecosystems (Borrini-Feyerabend et al, 2000; Dietz et al, 2003; Olsson et al, 2004; Folke et al, 2005; Pomeroy and Rivera-Guieb, 2006; Plummer and Armitage, 2006). Adaptive co-management is iterative: It repeats a process in stages to lead managers and fishers to a result approaching the one that was sought. Adaptive co-management is based on a slow social and institutional learning process. It involves devising plans that can be renegotiated and amended as changing conditions and needs dictate. This implies that each process for drawing up or imple-

Box 1 Application of adaptive co-management to fishery

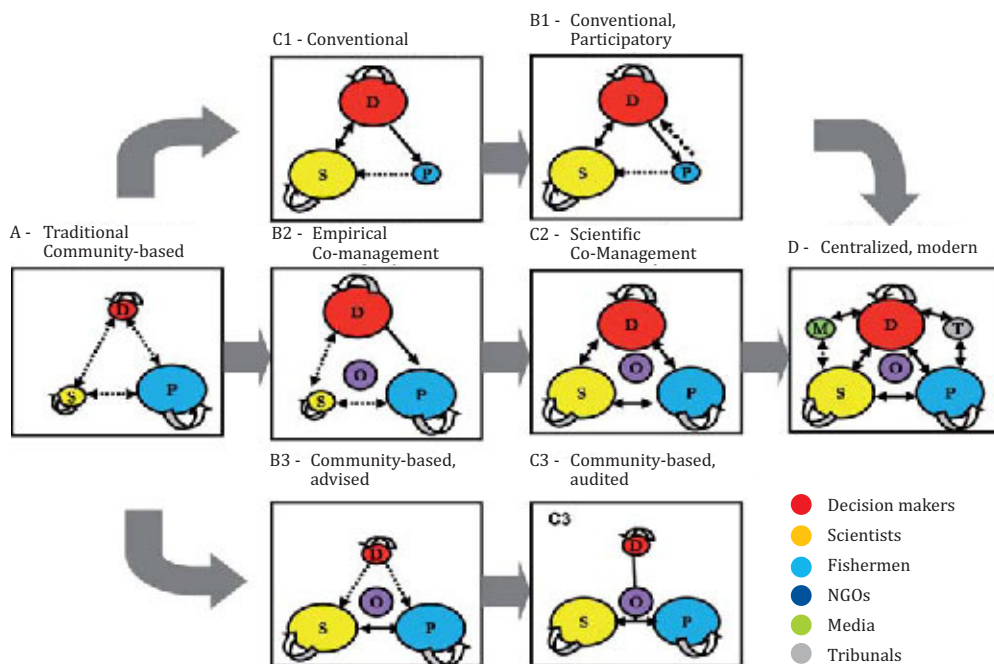
according to Borrini-Feyerabend et al, 2000; Pomeroy and Rivera-Guieb, 2006

(Additional information in the technical report)

A fishing community intends to try out a new method of fishing and judge how the results obtained match or agree with the expected results. The community as a whole, or a part of it, will accept, adapt or reject the fishing method. This deliberate experimentation, apprenticeship and adaptation on the part of the fishers are an essential component of adaptive management, which also relies on the willingness to learn of the institutions concerned. When the learning is shared (including institutional learning) between stakeholders who have negotiated and delegated the implementation of co-management arrangements, this is an adaptive co-management approach

menting an adaptive co-management plan is specific to the country and site, and cannot be reproduced identically (box 1).

Figure 3 Potential changes in one type of co-management (adapted from Garcia, 2011)



2.3 The choice of the type of co-management and the different scales of fisheries co-management

When drawing up a plan or a project, or reorganising a project in progress, the type of co-management can be chosen based on the following items (according to IUED's analysis framework (Hufty, 2007; Weigel, 2011)):

- Define each problem to be dealt with as expressed by the stakeholders in a specific context
- Characterise the stakeholders with interests related to the problem identified and differentiated according to their status and positioning
- Identify the nodes around which the stakeholders' interests converge or diverge
- Specify the local, governmental or "global" norms that orient the behaviour of the stakeholders
- Take into account the challenge of reconstituting the



processes or the succession of states fisheries management goes through

The question of scale arises mainly on the level of the problem to be dealt with: local, national, regional, transboundary or transnational. Co-management may be applied on the scale of a fishery or a set of fisheries, stocks of sedentary or highly migratory fish species, a locally situated ecosystem or a wider ecosystem. With the promotion of the ecosystem approach, we witness an extension of the scale considered, from co-management of a fishery to co-management at the level of an ecosystem. This extension can reach the transnational scale as part of the cooperative co-management of shared stocks of fish (transboundary, straddling or highly migratory). The determining of scales and taking into account of interactions between the different scales are key elements of fisheries co-management (cf. section 3.6: co-management in the management of fisheries). The precautions to be taken in terms of mobilising the stakeholders at each scale are covered in "Implementing co-management" (cf. section 3.6.4).

3 SUMMARY OF THE LESSONS TO BE DRAWN FROM THE LITERATURE, INTERNATIONAL EXPERIENCES AND POINTS FOR CONSIDERATION

3.1 The drivers of co-management

From an analysis of the literature and experiences of co-management, constants emerge concerning the drivers of co-management. First of all, the diversity of points of view depending on the stakeholder expressing them, followed by some universal drivers.

With regard to the Japanese co-management experience, Watanuki (2007) insists on the diversity of points of view in terms of co-management drivers depending on whether they are expressed by the government, the users of the resource, or the defenders of sustainable development.

- From the government's point of view, the driver is often reducing management costs, particularly those related to control and surveillance but also those related to data gathering

- From the point of view of the users, the drivers are to re-establish an economic surplus, reduce conflicts, involve these same users in the defining of management goals and in their implementation using a participatory approach

- From the point of view of the defenders of sustainable development, the driver is an approach to the sustainable exploitation of the resource.

For each type of fishing, the Australian Fisheries Research and Development Corporation (2008) gives nineteen co-management drivers, the main ones concern partnerships and shared responsibility, management transparency, enhancing confidence, management flexibility and a better capacity to respond to expressed needs, management at a finer scale, acceptance and conformity with decisions taken, equity or socio-cultural considerations, reconciling economic development and environmental protection, conflict reduction and resolution, and reducing the costs of fisheries development (table 1).



Table 1 Co-management drivers by type of fishing
(inspired by Fisheries Research and Development Corporation, 2008)

Driver	Type of fishing
Partnerships and shared responsibility for achieving common results	Commercial, recreational, native
Reducing conflicts, improving confidence and working relations between managers and fishers	Commercial, recreational, native
Reducing the necessity for political decisions	Commercial, recreational, native
Transparency of the costs of management and service provisions	Commercial, recreational, native
Reducing management costs	Commercial, recreational, native
To examine the existing regulatory approach and the possibility of developing more effective management	Commercial, recreational, native
Improving acceptance and conformity of decisions in terms of management	Commercial, recreational, native
More encompassing and transparent decision-making	Commercial, recreational, native
Flexibility and the ability to adapt in "real time"	Commercial, recreational, native
Improving innovation capacity and the response to the sector's development needs	Commercial, recreational, native
Capacity building and skills development	Commercial, recreational, native
Improving public opinion regarding the sector	Commercial, recreational
Improving cooperation between fishers	Commercial, recreational
Improving the fisheries investment climate	Commercial
The possibility of better social results via a better work-life balance	Commercial, recreational, native
The possibility of highlighting the economic and social importance of the impacts of the recreational fishing	Recreational
The implementation and recognition of environmental management systems and codes of good practice	Commercial, recreational, native
Enhanced dissemination and education	Commercial, recreational, native
Spatial or regional management on a finer scale	Commercial, recreational, native

3.2 Review of the costs and benefits of co-management

The literature highlights the difficulty of precisely identifying the costs and benefits pertaining exclusively to co-management, as well as the complexity of assessing them. This points to a lack of methodology on the subject. However, the majority of studies converge towards the conclusions mentioned below.

- The costs specific to co-management relate mainly to the transaction costs involved in the new induced contractual arrangements: initiation, application, control and adaptation of contractual relations (Williamson, 1998; Verhaegen and van Huylenbroeck, 2002). These costs can be broken down into ex ante and ex post (McCann et al, 2005), direct or indirect (Amblard et al. 2008), explicit or implicit such as opportunity costs (McCann et al. 2005).
- Co-management leads to higher short-term costs (in particular the costs of information and fixing objectives) than a centrally-management system. But in the long term, co-management fosters a reduction in costs (in particular the costs of distributing the resource among users, monitoring and surveillance, and regulation enforcement) (Hanna, 1995; Viswanathan et al, 2008) (box 2).

Box 2 **Comparison and trend in management costs of a co-managed fishery and a centrally-managed fishery**

*according to Viswanathan et al, 2008
(additional information in the technical report)*

The management costs of a co-managed fishery were compared with those of a centrally-managed fishery in the region of San Salvador in the Philippines. Three phases were defined for the period of nine years the project ran (1988-96). The first corresponds to the start-up of the co-management project characterised by the defining of the management structures; the second phase corresponds to the implementation of the co-management project with the mobilisation of all the stakeholders. During the first two phases, the management costs of the co-managed fishery were higher, which can be explained by a more intensive community education effort, among other things. But the trend reverses during the third phase, during the operational hand-over to local players: the management costs of the co-managed fishery decrease, as do those of surveillance, regulation enforcement and conflict resolution.

The specific benefits of co-management, according to Borini-Feyerabend et al (2004), are:

- Reduced costs in the long term
- Better distribution of costs across a larger number of stakeholders following the sharing of management responsibilities
- An attenuation in the threats to conservation and the use of resources on the part of outside interests, following the alliances set up between government agencies and local players
- Greater potential efficiency thanks to the pooling of knowledge and local skills (for example, in terms of the surveillance of the state of natural resources or the maintaining of sustainable exploitation practices).

The review of costs and benefits indicates the advantages of co-management (Pinkerton, 1989; Ostrom, 1990; Pomeroy and Berkes, 1997; Singleton, 1998; Carlsson and Berkes, 2005; Pomeroy and Rivera-Guieb, 2006). Co-management:

- induces a better distribution of jobs for it encompasses a wide range of capacities (from State to local communities) and comparative advantages
- fosters the building of a network for exchanging technology, scientific expertise, information on volumes caught or the status of fishing resources
- connects different types and levels of organisation: the representatives of these different types and levels coordinate their activities on a specific zone or resource
- leads to more involvement of fishers in managerial jobs, taking into consideration their know-how and expertise
- builds the capacity of the fishers to conceive and implement regulatory measures appropriate to local conditions
- leads to a reduction in long term costs, after an initial phase in which costs are higher
- facilitates conflict resolution, and therefore long term planning and the desire to invest in the appropriate institutions
- encourages the sharing of risks contrary to a management system that leans on only one or two stakeholders
- fosters the transparency and independence of the system
- leads the fishers to consider the resource as a long term asset
- enhances acceptability and legitimacy through community involvement.

3.3 The tools for assessing co-management potential

An assessment of the potential of co-management can be an asset in the initial or subsequent analysis of a co-management project. This assessment requires appropriate tools. According to the literature, there are three major tools.

- listing of all costs and benefits whether ex ante or ex post, direct or indirect, explicit or implicit, such as the cost and gains of opportunity (Hanna, 1995; Borrini-Feyerabend et al. 2004; Viswanathan et al, 2008).
- a linear regression model relating the level of success of a co-management system (measured by a composite index) to a series of variables considered as explanatory factors (community quotas, social cohesion, etc.). The regression serves to configure a decision tree which classifies the importance of the different factors in the success

of the co-management. The results are represented graphically in the form of a decision tree (Gutierrez et al, 2011).


- an evaluation grid of the co-management potential of several areas or fisheries, constituted by indicators divided into three classes depending on whether they relate to ex-ante conditions, conditions during implementation, or conditions regarding the community values and principles of the fisherfolk. A scale of assessment is proposed concerning the validation of the conditions under consideration, and then a global aggregate score is assigned to each case study. This scale of assessment can be used to highlight the area or fishery with the greatest co-management potential (Fargier, 2012).

3.4 Key success factors and principal difficulties in fisheries co-management

3.4.1 The key factors for the success of co-management

The success or failure of a co-management process is affected by context-dependent variables that can be divided into three categories: Those pertaining to the supra-community level, community level and the level of the household or individual (Pollnac, 1988; Pomeroy et al, 2011). These key conditions concern the different stages (ex-ante and while the co-management is in place) and the

different levels of organisation. The literature brings to light fourteen key conditions for the success of co-management in the field of renewable and fisheries natural resources (Pinkerton, 1989; Ostrom, 1990, 1994; Berkes, 1997; Pomeroy and Berkes, 1997; Jentoft et al, 1998; Pomeroy et al, 2001, 2011; Pomeroy et al., 2001, 2003, 2011; Pomeroy and Goetze, 2003; Pinkerton, 2007; Gutierrez et al, 2011; Pomeroy et al. (2011).

 The key factors that contribute to the success of a co-management process are the following:

- The existence of decentralisation and delegation of authority on the part of the government, including the right to organise and make arrangements concerning management
- The existence of organisations prior to the co-management
- Clear identification of those who have the right to participate in management
- The existence of mechanisms for the coordination of the government and community concerned
- The existence of cooperation and direction at community level
- The participation of all the stakeholders involved and group cohesion characterised by the desire to engage in collective action and the common understanding of problems and alternative solutions
- Adaptive co-management based on self-assessment and gradual adjustments leading managers and fishers to a result approaching the desired one, and based on learning
- The drafting of collective decision-making rules and the enforcement of regulations and a penalty structure
- Conflict resolution mechanisms
- The recognition of traditional knowledge
- Participatory monitoring and evaluation and a transparent distribution of information
- Well-defined, suitable limits (community, resource, management area)
- Benefits greater than costs and made explicit to the players.





Another condition for success is a sufficiently long period for the co-management plan or project and sustainable funding for the co-management system implemented. For in fact, the processes associated with the sharing of responsibilities among several stakeholders in such a system requires learning curves that last several years, whereas national decision-makers and the donor agencies base their intervention on short periods (most often under five years). The problem of sustainable funding is all the more important as the evaluation, capitalising on lessons and continuous adjustment must be estimated in relation to long term goals and policies. There are numerous contradictions, for, while seeking to secure the sustainability of their actions, the national public authorities and donor agencies lack political will and consistency, whereas new mechanisms adapted to the specific needs of co-management are expected.

Point for consideration n° 1 ***Take into account the timing of processes and secure the sustainability of co-management funding***

- Integrate the learning time for the different co-management phases (pre-diagnostics, design, implementation, monitoring-evaluation) in order to build trust and enable a better match between means deployed and expected results
- Steer towards public policies and project funding mechanisms (donors/institutions) that take into account the length of the learning process associated with co-management (in excess of ten years, generally)
- Estimate the costs of a programme co-management, distinguishing between ex ante and ex post, direct and indirect, explicit and implicit costs of the different co-management phases
- Make sure the different stakeholders concerned have the capacity to fund their participation in the different co-management phases and fully play their part
- Develop mechanisms for the redistribution of funding and allocation of fiscal resources specific to the local communities or organisations involved in co-management
- Develop innovative mechanisms for the long term funding of co-management (trust fund, taxes, etc.)

Meeting these conditions leads to the success of the plan or project and can potentially reverse the trend regarding the status of the resource, social cohesion and conflict reduction (box 3).

Box 3 **Trend reversal related to co-management: the example of the Mape dam in Cameroon (1988-2005)**

Authors: Bozena Stomal and Jean Yves Weigel (additional information in the technical report)

according to Belal and Baba (2006), Bigombe (2002)

In 1988, the filling of the Mape dam (550 square kilometres) in Cameroon attracted more than 4,000 fishers in 128 camp settlements using a multitude of types of gear and sometimes illegal fishing practices. The multi-ethnic community, diversity of interests and divergences in the management of the areas shook social cohesion and created tension and conflicts. This worrying situation led the administrative authorities and the Fisheries Department to initiate a co-management process in 2002. The following activities were given priority: the setting up of a committee in 2003, the running of social communication campaigns, the organisation of communities and training for stakeholders (negotiation, management plan).

In 2005, an assessment showed a trend reversal that was attributed to co-management. The achievements of the co-management process were to build social cohesion and reduce conflicts, as well as enhancing stakeholder cooperation, better enforcement of the regulations and a decrease in juvenile catches.

3.4.2 The major difficulties associated with co-management

One of the first difficulties of co-management derives from the necessity of a certain degree of independence on the part of the local communities to whom authority is delegated in terms of management, rights and responsibilities. The main obstacle to this independence may emanate from government agencies that refuse to give up their powers, whether at national or local level.

Une deuxième difficulté de la cogestion a trait à l'intégration des savoirs locaux dans la prise de décision. L'intégration de ces savoirs permet des appréciations qualitatives nécessaires et très utiles dans le cas de socio-écosystèmes caractérisés par une grande incertitude et des processus naturels irréversibles. Une des difficultés notables dans la gestion des pêches a été la différence d'appréciation de l'état et des conditions de la ressource entre les communautés locales, les scientifiques et les agences gouvernementales.

**Box 4 Problematic co-management:
the example of Senegal**

Author: Jean Yves Weigel,

*adapted from Ministry of Maritime Economy (2011)
(additional information in the technical report)*

In Senegal, the authorities are more concerned about enforcing administrative procedures than running the Local Artisanal Fishing Committees (CLPA), the main operating constraints of which are: the lack of coordination between the different levels they comprise, the low involvement of grass-roots players in decision-making, the inadequate capacities of the players, the passive attitude of the authorities, the lack of operating means, the lack of technical and financial support from the authorities, the absence of synergism with the initiatives of the other programmes or projects of the Maritime Fisheries Department, the use of the CLPA in the validation of initiatives without their prior involvement in design, and the lack of dynamics of certain CLPAs in taking initiatives.

There are six types of causes of this situation. The first is the absence of a clear strategy with precise objectives assigned to the CLPA. The second is defective communication. The third cause relates to training programmes that are ill-adapted and intermittent. The fourth cause is the lack of empowerment of the players. The fifth cause is the lack of devolution of financial means. The sixth cause is the existence of several regulatory texts ill-adapted to the fishing sector.

A third difficulty is the obligation for transparent processes, decisions, and the results of research, monitoring and evaluation. This transparency favours not only the comprehension and apprenticeship of all the stakeholders, but also their participation and implication in the implementation of co-management. This obligation presupposes methods for updating and disseminating information to the stakeholders as a whole.

A fourth difficulty relates to the complexity of factoring in all the functions critical to effective fisheries management; one pitfall to be avoided being excessive focus on one such function, which could lead to partitioning that would be prejudicial to the effectiveness and sustainability of the co-management.

A fifth difficulty concerns the equitable allocation of access and of the resource itself. This is because co-management projects often include restrictions, or even exclusions, pertaining to local fishers (industrial or artisans) or foreign fishers. To mitigate the effects of these restrictions or a possible exclusion, considerations of equity accompanied by attenuation or compensation measures should prevail. Managing these compensation measures can also engender difficulties (cf. section 3.6.5).

A sixth difficulty relates to the coordination of stakeholders. The increased power of certain stakeholders (fishers' communities, NGOs) brings about the necessity of intensive coordination. In particular to avoid redundancy (check the justification of new institutions before they are created) and competition between "development brokers" in the least developed countries.

A seventh difficulty resides in the change of scale with the problem of the transferability of generalisations from a much localised situation to a broader spatial co-management framework (Raakjaer Nielsen et al, 2004). In the case of the co-management of stocks on the scale of a large ecosystem or of shared stocks, one specific difficulty is the distribution of powers among community bodies, government or international agencies who are guarantors of the national or international legal regimes applicable to fishing.

The reasons for failure or problematic co-management relate most often to the size of the zone concerned, the weakness of accompaniment to the process, a per project approach that is too short term, the lack of a clear strategy, lack of communication, inadequate structuring of communities, no stakeholder empowerment, and the lack of devolution of financial means (Fargier, 2012; MEM, 2011; boxes 4 and 5).

Box 5 **Co-management difficulties for an over-sized area and lack of long term companion measures: the marine responsible fishing area in the Golfo Duce (Costa Rica)**

according to Luc Fargier (2012)

The scale of assessment of co-management from Fargier (2012) reveals that the marine responsible fishing area in the Golfo Duce only meets a third of the necessary conditions for the success of a co-management process. The extensive area involved did not foster its appropriation, management and surveillance, as confirmed by the fact that most of the fishers do not know where the boundaries of the area lie. Its sheer size means that fishers far from the centre have to travel for three days to attend a meeting at the headquarters of the marine area. This is an obstacle to the fishers' participation in negotiating and implementing the management plan. To this difficulty can be added the number of communities concerned, the lack of continuous technical support throughout the process, the fact that a new approach is adopted for each (there have been interventions from many opportunistic NGOs who apply this type of logic). These elements seem to be strong initial decisive factors that could explain the low co-management potential of the marine resources of the Golfo Dulce.

3.5 **The principal conditionality of fisheries co-management**

3.5.1 **Clarification of the legal, institutional and administrative framework**

The legal, institutional and administrative framework is typically ill-adapted to co-management or lacks consistency. The principles of co-management are rarely asserted or recognised, the rights of stakeholders and the sharing of responsibilities typically not really clarified and not secured. Steering by means of a rigid institutional and administrative framework is not suited to processes that evolve, which are typical of fisheries resource co-management. The incorporation of the principles of co-management into fisheries sector policy on an institutional or administrative level, as well as in terms of means, has not been achieved, or, in some instances, even started.

Point for consideration n° 2 ***Adapt the legal, institutional and administrative framework of co-management; integrate co-management into fisheries sector policy***

■ **Adapt the legal framework to co-management** prior to the implementation of plans or projects including the:

- assertion of the principles of co-management (partnership and shared responsibility, transparency and flexibility, local scale) within the framework of effective decentralisation
- securing of co-management rights to render them enforceable
- capacity and the possibility for rights holders to obtain compensation
- protection of individuals against abuse of local powers
- nature of the legal and administrative provisions (binding, non-binding, compulsory, voluntary, etc.)
- nature and extent of the recognition of locally promulgated rules
- limits and conditions of State intervention
- methods for interaction between partners and with the State
- recognition of specific fisheries co-management arrangements and their adaptability (mechanisms, regulations, specific measures)

■ **Integrate co-management into fisheries sector policy on an institutional and administrative level by:**

- Affirming completed decentralisation as a prerequisite to co-management and the guideline for fisheries policy
- Including as part of the fisheries sector policy a statement of principle on the necessity of co-management for transparent, consultative and participatory management
- Clarifying mandates, powers and the institutional and administrative coordination relative to the fisheries sector
- Redirecting institutional and administrative means
- Support for innovative research meeting the needs of co-management, capable of incorporating local knowledge into the decision-making process and assessing the impacts of co-management, combining local level decision-makers and researchers

3.5.2 Stakeholder capacity building

Local and national stakeholders do not all have the same capacity to discuss, negotiate and choose the management rules. They do not control all the vocabularies, the technical aspects of resource management, the issues at stake related to the different implementation phases of a co-management process. The lack of clarification of goals, of respective roles, lack of attention paid to dissemination needs can affect consensus and management decisions.

The stakeholders' availability for cooperation partly depends on their diversity, history and socio-cultural references. Improvement can be attempted but it remains a management constraint to be reckoned with. Accompaniment, training-action in an iterative, progressive process constitutes one of the major challenges for projects involving co-management arrangements.

Point for consideration n° 3 ***Stakeholder capacity building and empowerment***

- Assess the effective capacities and needs in terms of control over the negotiation processes and tools used. This assessment should be done for each stakeholder, given the different co-management phases they take part in. The phases and actions in terms of co-management must be conceived in accordance with a realistic assessment of the stakeholders' co-management capacities.
- In plans or projects, develop a "capacity building" component in the form of a "training-action" adapted to needs, integrated into the co-management process and drawing on methodology guides and processes involving the representatives of local players in their diversity.
- Build the capacity of the stakeholders involved in co-management in terms of participation, negotiation of agreements, conflict resolution, etc.

3.5.3 The necessity for reliable data and suitable tools

The lack of data on the socio-ecosystems concerned and the territories they are rooted in, which relates to a lack of means on the part of the research centres in the SRFC member States, represents one of the major difficulties for setting up co-management schemes. Some of these weaknesses affect, or even influence, the diagnostics. On the other hand, this causes regular calling into question, which affects dialogue and decision-making within the areas of consensus.

The lack of spatialisation of data on the socio-ecosystems exploited (players, habitats, resources, etc.) is important. Spatialisation is the basis for ecosystem management and, for example, for the allocation of territorial usage rights in the coastal zone. It is therefore urgent to improve the data collection process pertaining to the spatial structures of fisheries (distribution and migration of stocks, distribution and migration of fleets, nurseries, breeding grounds), to vulnerable marine ecosystems, zones where vulnerable species are concentrated, various prohibition zones, etc.

A review of the tools for assessing co-management shows a relative weakness concerning the indirect and implicit cost-benefits analysis as well as the filling in of their indicators. The robustness and simplicity of the indicators and an improvement in the arrangements for gathering and centralising data are to be sought.



Point for consideration n° 4 ***Complete and spatialise the data on fisheries socio-ecosystems, improve measuring tools, fill in co-management indicators***

- Complete the missing data on the socio-ecosystems potentially co-managed by boosting the resources of the national research institutions, by securing regular monitoring of socio-economic and bio ecological governance, by integrating traditional knowledge or knowledge from previous projects.
- Promote the development of spatialised co-management with the creation of databases, digitalisation of data, in the GIS data format, in particular, the production of an atlas. These elements must be coordinated at national and regional level.
- Improve the tools for assessing co-management, in particular cost-benefit analyses, by providing more in-depth estimates of indirect and implicit costs and benefits and developing and testing cost-benefit indicators at sub-regional level.
- Identify and fill in the co-management indicators making use of methodological achievements, drawing inspiration from and adapting the indicators of governance (level of participation and involvement of stakeholders, degree of interaction between stakeholders, perception of stakeholders, how the legislation matches co-management, level of conflict, etc.). These co-management indicators must be completed by socio-economic indicators giving precedence to the effects of ecosystem uses on the local economy (revenue, jobs, net added value, etc.), and bio ecological indicators (abundance, biomass, specific richness, trophic level, etc.)
- Develop a methodology guide: “design, implementation and assessment of fisheries co-management” (in the form of instruction sheets) adapted to the specific features of the SRFC domain and regularly improved through stakeholder feedback on use.

3.6 La cogestion dans la gestion des pêches

The analysis of how co-management is included in fisheries management led us to consider the sharing of functions associated with fisheries management, decision-making cycles and processes in an uncertain milieu, to distinguish the design and drawing up of a co-management plan or a project from the implementation, reviewing one by one the technical measures for fisheries development applicable to co-management, then going into greater depth on certain subjects of interest for the SRFC area. These are: transboundary and transnational co-management, integration of fisheries co-management and Marine Protected Areas, application of co-management to artificial reefs and fish-aggregating devices.

3.6.1 The sharing of the functions associated with fisheries management

All operational fisheries management systems take several functions into account. This may appear complex to implement in a co-management system with levels of sharing that vary depending on the expected results. It is simplified by the use of grids describing the fisheries management functions in three broad categories (cf. tables above and technical report): Decision support, decision-making, implementation of decisions, which clarifies the position of the functions of knowledge acquisition, monitoring, control & surveillance and planning.

These grids allow decision-makers to take the different technical parameters into account more effectively and coordinate the strategies related to fisheries management.

☞ *The sharing of functions (data acquisition, monitoring system, surveillance and application of sanctions, assessment) between the main stakeholders leads to a distinction between the elaboration phase and the implementation of a management plan (tables 2 and 3), and the identification, for each function, of the stakeholders concerned, whether fishing communities or fishers' associations, government agencies, outside agents, or other stakeholders (Pomeroy and Rivera-Guieb, 2006). The effectiveness of a co-management plan is associated with the fact that the responsibilities for each function are clearly defined, each function is rooted in an institution and possesses means, and the functions are integrated (cf. box 6 and technical report).*

Table 2 Simplified grid of the functions involved in fisheries management (according to Yan Giron)

The major functions associated with fisheries management	The name of the function associated with fisheries management
Decision support	Basic knowledge acquisition
	Information system
	Expert system
Decision	Definition of a guideline
	Actual decision-making
	Definition of administrative rules
Operational implementation of decisions	The monitoring and application of rules (surveillance and control)
	The legal capacity to sanction offenders
	The capacity to enforce legal decisions

Table 3 Distribution of stakeholders' activities in a co-management plan
(adapted from Pomeroy and Rivera-Guieb, 2006)

Stakeholder	Activities during set up	Activities during implementation
Fishing communities or associations	<ul style="list-style-type: none"> ■ Participation in the negotiation and drafting of the plan ■ Contribution to the formulation of the goals of the plan ■ Contribution of information and comments on the plan project ■ Contribution to the mission statement ■ Organisation of meetings ■ Participation in the co-management organisational diagram ■ Elaboration of community consensus 	<ul style="list-style-type: none"> ■ Participation in the implementation of the plan ■ Conformity with rules and regulations ■ Participation in the monitoring of the implementation of the plan ■ Active participation in educational and training activities ■ Proposals in terms of development and of means of existence ■ Contribution of information and comments on the plan implementation
Government	<ul style="list-style-type: none"> ■ Contribution of a legislative, public policy and planning framework ■ Participation in negotiation and planning ■ Assistance in identifying sources of financing ■ Participation in the organisation of the co-management ■ Invitations to and running of meetings ■ Clarification of responsibilities 	<ul style="list-style-type: none"> ■ Assistance with the implementation of the plan ■ Institutionalisation of a structure for the implementation of the plan ■ Writing and approval of laws, decrees or orders ■ Assistance and support with fund raising
Outside agents (NGOs, etc.)	<ul style="list-style-type: none"> ■ Facilitation of the negotiation and planning processes ■ Technical support and training ■ Assistance with the setting up of a co-management organisation ■ Training in negotiation and planning ■ Assistance with the mission statement ■ Elaboration of consensus 	<ul style="list-style-type: none"> ■ Organisational capacity building for obtaining funds ■ Technical support and training ■ Strengthening of community organisations ■ Training of managers ■ Assistance in monitoring ■ Support in terms of development and of means of existence
Other stakeholders	<ul style="list-style-type: none"> ■ Participation in the negotiation and drafting of the plan ■ Contribution of information and comments on the plan project 	<ul style="list-style-type: none"> ■ Participation in the implementation of the plan ■ Conformity with rules and regulations ■ Contribution of information and comments on the plan implementation

**Box 6 Integration of several functions in a co-management system:
the example of the scallop (France)**

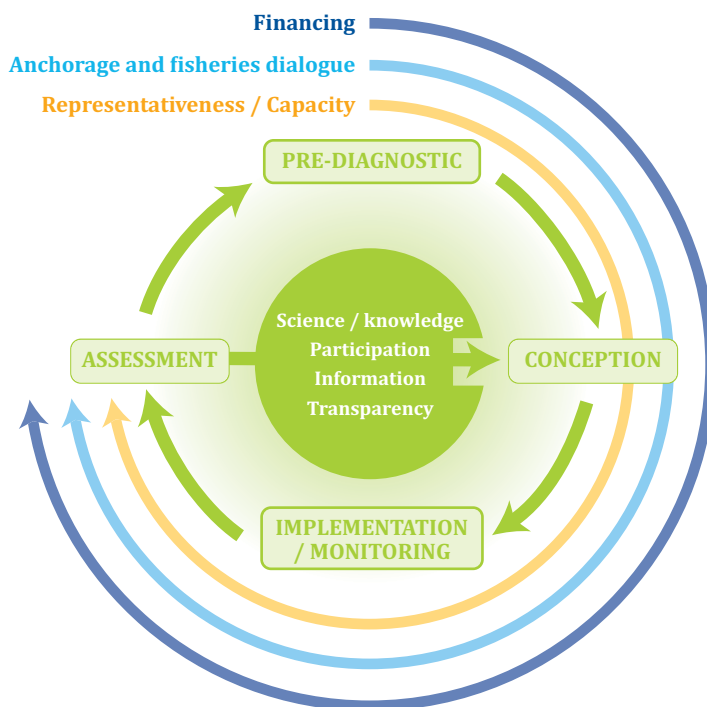
Author: Yan Giron (additional information in the technical report)

The management of the exploitation of scallops in the Bay of St Brieuc is an example of the sharing of responsibilities and fisheries management functions in the coastal strip. In France, coastal resource management is conducted in a form of co-management involving professionals and the State, with the support of scientific evaluations. For this stock, the management tasks are shared as follows. At the start of the campaign, professional vessels collect samples to conduct a biomass evaluation. The scientists then generate an exploitation advisory notice. The shellfish commission of the Regional Fisheries Committee fixes the levels of capture authorised based on this notice and submits it to the State for legal validation. The fishers perform the daily regulation and control measures as follow: time of fishing, duration of fishing, aerial verification. The State services conduct all or part of the control, with any legal actions or combating illegal trafficking conducted in parallel. In the event of an infringement, the representatives of the profession file a complaint against the offenders and may define internal penalties (suspension of licences, or other). This system has allowed the fishery to become one of the best managed in Europe, enabling the fishers to reduce operating costs, better manage commercialisation and sustainably maintain their activity. This form of co-management is technically fine-tuned. It comes at a cost. But the benefits have made it possible to sustainably share fishing potential between large numbers of fishers, since the 1980s.

3.6.2 Decision-making cycles and processes

Fisheries management entails decisional processes that are part of risk decision cycles in uncertain environments and which transcend the scales of the decision (global, regional, national or local). Compared to conventional fisheries development, adaptive co-management enables a better completion of these cycles through better implementation of the decision processes thanks to a set of interactions between the different stakeholders, according to a gradual process (iterative and self-evaluation or “step by step”). In particular, the cycles are characterised by numerous feedback loops for refining the management strategy and possibly the sector policy at any point in the cycle. This approach can be recorded in a more or less formal catalogue of good practices that represents the social memory built up over successive iterations on the site under consideration.

Figure 4 Cycles of decision-making and collaborative implementation of fisheries co-management processes (according to Yan Giron)



☞ There are several stages involved in the design and drawing up of a co-management plan or project: pre-diagnostics, the setting up of a co-management body to draft the mission statement, the formalising of a co-management organisation encompassing an agreement on the rules and procedures for negotiation and decision-making, a co-management plan or project, a co-management agreement which is the last stage of the design and set-up. Related to the conditionality of co-management, the design and development require the adaptation of the legal, institutional and administrative framework, the strengthening of the stakeholders, reliable data on the socio-ecosystems and suitable tools.

3.6.3 The design and formulation of a co-management plan or project

Pre-diagnostics are justified by the frequent lack of clarification of the issues at stake in the co-management in liaison with an imprecise identification of the problem facing the fishery (overcapacity, depletion of the resource, etc.). More specifically, the link between the fishing problem and the existing system of governance and its possible weaknesses is rarely highlighted.

Point for consideration n° 5 ***Produce pre-diagnostics from data on the socio-ecosystems concerned***

- Identify and precisely analyse the problem of the fishery and the link with the issues at stake for co-management
- Relate this problem to the current system of governance and its possible weaknesses through an analytical framework (problem, players, norms, nodes, processes) and to the filling in of indicators
- Define the major stakes for co-management, the main goal and the specific objectives in relation to the fisheries management functions
- Choose the type of co-management suited to the problem at hand and the stakes, which means giving preference to certain stakeholders, a scale of analysis and the determining of modes of interaction between scales, and the relative importance of each stakeholder

How representative the stakeholders are and how they are designated are a key factor in the smooth running of co-management framework. Nonetheless, insufficient consideration is sometimes given to existing organisations. The co-management body should be set up on the basis of the local system of stakeholder representation to the extent that this can be reconciled with co-management. The body's constitution poses the problem of the mobilisation and proper representation of all the stakeholders concerned, in particular women and migrants. It is understood that certain representatives will be mobilised to a greater or lesser degree, depending on the type of co-management, the scale concerned (not all the players need to be mobilised on each geographic scale) and the co-management phase. The co-management body writes a mission statement stipulating the management goal, strategy and values shared by the different stakeholders (Margoluis and Salafsky, 1998). It fixes the co-management organisation and establishes a co-management agreement. It is the node for negotiation, decision-making and the drafting of documents. It may be a formal or informal body (Pomeroy and Rivera-Guieb, 2006).

The formalising of the co-management organisation encompasses the:

- agreement on the rules and procedures for negotiation and decision-making which should contribute to the transparency of the process (Borrini- Feyerabend et al, 2000),
- responsibilities of each stakeholder which must be recorded in the co-management organisation (Pomeroy and Rivera- Guieb, 2006),
- choice of management unit which should refer to an existing system of governance and pre-defined limits (Berkes et al, 2001) and the size of which should be sufficiently restricted to allow effective management (Fargier, 2012) but large enough to take ecological management considerations into account (Pomeroy and Rivera- Guieb, 2006),

Point for consideration n° 6 ***Reinforce the co-management body through adequate stakeholder representation and mobilisation***

- Identify and spatialize the stakeholders and their existing governance method;
- Try to simplify the co-management body and the way it works;
- Make sure the stakeholder representatives are truly representative;
- Give preference to the local system of stakeholder representation to the extent that this can be reconciled with co-management;
- Mobilise all the stakeholders concerned, without omitting those who tend to be marginalised;
- Choose the stakeholders to be mobilised according to the scale in question and depending on each management unit: local (fishing communities and local representatives of the sector, local powers, local authorities, local groups and project managers, experts and researchers), national (national fishers' organisations and sector players, central authorities, representatives of donors, experts and researchers), and transnational (representatives of the countries, regional organisations, experts and researchers);
- Specify the stakeholders to be mobilised for each co-management phase, assigning them the status of decision-maker or observer.

■ co-management plan or project details the activities to be conducted to achieve the objectives, the expected outputs, the schedule, the business plan estimating the cost of the operations for each activity decided upon, to which is associated a source and method of financing (DENR et al, 2001).

During project design or the development of a new phase, the preparation for co-management should include the definition of a plan of action which should be budgeted and financed for the duration of the project. It should incorporate a system of evaluation and adjustment. It should be validated collectively in order to enhance ownership on the part of the different players.

The drafting of a co-management agreement is the responsibility of the co-management body: It should have the status of a rule or contract and should be respected. It details the composition of the management body, the roles and obligations of the stakeholders, the description of the

co-management organisation, provisions for conflict resolution, monitoring and evaluation, and compensation for aggrieved stakeholders (Pomeroy and Rivera-Guieb, 2006; Borrini-Feyerabend et al, 2000).

Point for consideration n° 7 ***Consolidate co-management organisation and determine a plan of action***

- Find a way of simplifying co-management organisation
- Make sure there are mechanisms for steering the transparency of the negotiation and decision processes
- Clarify the responsibilities of each stakeholder and their organisational interactions, drawing on the analysis of their legitimacy and representativeness
- Encourage institutional synergy between the local, national and regional scales
- Give preference to the matching of proposed activities with the weaknesses identified in the pre-diagnostics at the level of each of the key fisheries management functions
- Integrate into the co-management plan or project a system for monitoring-evaluation, the cost of which should be scheduled
- Integrate into the co-management plan or project a system for informing the population concerned about the pre-diagnostics, co-management body, co-management organisation, the proposed activities, the results of the monitoring and evaluation and the decisions taken
- Integrate into the co-management plan or project a system for the distribution and dissemination of traditional knowledge and the main results of the research, taking local languages into account
- If possible, integrate into the plan or project an expert system adapted to the type of co-management chosen and the scale in question
- Have the plan or project validated collectively so that the stakeholders assume ownership of it
- Put in place a legitimate co-management facilitator and ensure there is sustainable funding for their actions
- Give preference to collective learning (including institutional) of the stakeholders to foster the development of the organisation within the framework of adaptive co-management.

3.6.4 The implementation of a co-management plan or project

TRANSPARENCY AND GRADUAL COLLECTIVE LEARNING OF GOOD GOVERNANCE

Co-management depends, among other things, on the gradual building of trust both in the instances and in the reliability of the information provided by each party. The lack of information or outreach can contribute to the lack of comprehension of the new processes and tools developed in co-management. This often leads to the participants having difficulty positioning themselves and acting

fully within the co-management process. In addition, the studies and data produced by the research centres remain obscure, little-disseminated and are not systematically presented to the operators concerned by the co-management.

Furthermore, processes that are not consolidated, commitments not met or discontinued support can sustainably affect the dialogue and involvement of the stakeholders and therefore the governance as a whole. In this sense, the sustained political will of the parties and the meeting of commitments are to be sought, as well as the development of sustainable funding mechanisms.

More or less intense disruptions from the outside may also occur in the course of the process (political change, the addition of a new instance of representation, bio-climatic effect on the resource, arrival of a project run by an NGO or a new donor agency, etc.). The consolidation of collective learning and the maintaining of strong institutional and legal anchorage should make it possible to cope with such disruptions.



☞ *The implementation of a co-management plan or project induces specificities at the level of each of the main components of the implementation (according to Pomeroy and Rivera-Guieb, 2006), in terms of:*

- *governance and involvement of the players; transparency, the dissemination of mechanisms, outputs and regularly informing all the players consolidates the adaptive implementation of co-management which should develop step by step. Along with sustainable funding of processes and facilitation, it contributes to consolidating the processes in the long term;*
- *the application of the regulations, control and enforcement of sanctions; the specificities are the promotion by the communities or associations of fisherfolk and their involvement in applying the rules, controlling and enforcing sanctions;*
- *control and surveillance, the specificities concern the development of synergies between government agencies and communities or organisations of fisherfolk, as well as the redistribution of part of the related resources towards the latter;*
- *monitoring; co-management is accompanied by the involvement of all the stakeholders in gathering data and choosing indicators, but also by the transparency of the results of the monitoring;*
- *evaluation; the principal specificity is a participatory approach which leads to experience feedback, fostering the learning of all the stakeholders, including the institutions;*
- *networking and advocacy; the specificity of co-management is the effort to create and maintain interconnection as well as the encompassing of all the stakeholders which fosters the apprenticeship of co-management.*

Box 7 The structured formulation of a co-management plan: the example of solefish fishery in The Gambia

Author: Jean Yves Weigel

(additional information in the technical report)

according to Ministry of Fisheries, 2012 and Tobey et al, 2009

The Fisheries Act 2007 provides the legal basis for the co-management of small-scale fisheries in The Gambia. The first fisheries co-management plan concerns artisanal solefish fishing. The government of The Gambia, in partnership with the USAID, the University of Rhode Island and the WWF, supported this plan by organising co-management workshops, direct training, collaborative research and institutional capacity building. The fishers and the industry also helped to formulate this Plan with their knowledge of solefish fishery and by gathering data. The Plan was designed as scalable in keeping with availability and data analysis and changes affecting catches and environmental conditions. A special solefish management zone was promulgated encompassing the waters of the Atlantic shoreline and shorelines adjacent to the estuarine areas of The Gambia River out to 9 nautical miles.

The Ministry in charge of fishing delegated exclusive solefish fishery rights to NASCOM (National Sole Fishery Co-Management Committee) and LACOM (Landing sites Co-Management Committees) which are attached to it through the intermediary of the CFC (Community Fisheries Centers). NASCOM consists of representatives from the fishing communities, fish-mongers and processors, LACOMS, the Gambian Artisanal Marine Fisheries Development Association (GAMFIDA), the National Association of Artisanal Fishing Operators (NAAFO), municipalities, the Department of Fisheries and the industrial sector.

In 2012, without anticipating on the development of this co-management system, the lessons that can be drawn are: an adequate legal and institutional framework, the successful mobilisation and capacity building of all the stakeholders involved, and the matching of operating rules to objectives.

Point for consideration n° 8 Consolidate transparent and adaptive implementation of co-management as well a information adapted to the different scales

- Implement successive cycles of increasing complexity enabling start-up on small, achievable goals, test and develop the system, reinforce collective learning of the process and of the way the instances of co-management work;
- Check that the measures are coordinated in time and space (geographically);
- Regularly formalise the process and the new co-management responsibilities to allow each of the participants to understand the changes made to governance;
- Accompany and make sure transparency is respected during the periods of transition and renewal of co-management instances;
- Maintain information arrangements throughout the duration: develop the mechanisms for information circulation and transparency (between ministries, players and sites, etc.), use multiple communication tools, and take national languages into account. Assess and improve the arrangements where necessary;
- Promote traditional knowledge and involve researchers and the expert system in the dissemination and transmission of regular information to the players;
- Take into account the different national languages and multiple communication tools to disseminate the results of the diagnostics, evaluations, decisions taken, control measures and results of the enforcement of penalties, depending on the scales and the target players;
- Ensure sustainable funding for “information” and the implementation of the co-management. Consolidate and perpetuate the national co-management funding mechanisms and take into account the critical transition phases between major programme phases to ensure continuity.

Box 8 **Companion modelling as a possibility
for fisheries co-management
(ComMod approach)**

Authors: David de Monbrison and Pablo Chavance (additional information in the technical report)

adapted from Bousquet and Voinov, 2010; Worrapimphong, K. et. al, 2010, The ComMod Group, 2009

The ComMod approach takes place in two phases. First of all, the building of shared, spatialised diagnostics, scenarios for future changes in the resource which are explored by the players in the form of simulations /game playing. Secondly, the results of the simulations/game playing are used as the basis for defining possibilities for improving the management of the resource in question and the building of collective commitments.

This approach can usefully be developed in systems with little information as it promotes traditional knowledge and collective learning, through a concrete vision of the consequences of the decisions taken or of the options for fishery development. There are a number of conditions for their application, including strong involvement and investment by people and institutions, both to effectively accompany the different stages and to allow the optimal transfer of the tool and perpetuation of the process undertaken.

**CO-MANAGEMENT, CONTROL,
SURVEILLANCE AND REGULATION ENFORCEMENT**

The application of the regulations pertaining to a co-management plan or project should follow four principles: (i) the regulations must have the agreement of the associations and individuals concerned, (ii) the promotion of the application should be voluntary, (iii) socio-cultural sensibilities must be taken into account, (iv) an official public sanction should be practiced (Oposa, 1996). Enforcement of the regulations in a co-management system requires the consultation and coordination of all the co-management units; a co-managed fishery has the advantage of a greater moral obligation on the part of fisherfolk and professionals in the sector who were involved in formulating the regulations and the methods for applying them.

The application of the regulations presupposes an effective, optimised control and surveillance system which represents a considerable expense but may help to keep conflicts at bay. Performance levels in this domain relate to administrative and institutional capacity, the adequacy of the legal framework, but also to the perception of the players concerning the legitimacy of the measures binding on them. The direct involvement of the fishers, whether industrial or artisanal, is not devoid of risks since the divergent interests of the players, combined with the detection of illegal activities, expose the fishers to major repressive actions. The definition and conducting of the plan or project relative to the application of the regulations, control and surveillance, must also be appropriately supervised with the corresponding means of execution. The setting up of warning systems and the development of synergies between government agencies to be combined specifically according to each national or local situation are recommended (cf. sheet no. 11 of the technical document "Fisheries co-management and the surveillance and control of fishing activities in Canada and

**Point for
consideration
n° 9** ***Optimise the enforcement
of the regulations,
control and surveillance***

- Define the respective roles of the fishing communities and government agencies in the system for enforcing the regulations;
- Train new stakeholders involved in the chain of decisions and sanctions and in the technical means for control and surveillance;
- Develop synergies between modern and traditional control-surveillance systems thanks to the pooling of means enabling active participation of the stakeholders in determining the methods for control and surveillance and sanctions;
- Adopt dissuasive sanctions which vary depending on the seriousness of the offence and amend them over time;
- Mobilise the requisite means, possibly with the use of the funds generated from fines to pay for the control and surveillance system;
- Set up optimally cost-effective systems (AIS-Radar systems combined with coastal telescopes);
- Communicate the results, frauds and sanctions, arrests, and any lessons to be drawn to increase transparency and the sense of justice for those who respect the rules.

Benin"). However, the involvement of communities of artisan fishers in control and surveillance requires that the artisan fishers keep within the limits stipulated by the legislation and the operational procedures involving other government players. This involvement poses the problem of the redistribution and sustainability of the means which are often assigned by the more or less serious involvement of the stakeholders or the administrative authorities concerned.

MONITORING-EVALUATION SYSTEMS AND THE CO-MANAGEMENT PROCESS

The challenge for monitoring is to provide elements to assess the degree of realisation of the activities scheduled through the management plan or project and what should be done to improve them. Monitoring is performed by gathering data and calculating indicators which enable a comparison of the effective results with a reference point. The comparisons may concern the change that affected a target group following the implementation of the plan or compared to a similar group that was not targeted. Monitoring is a process of continuous examination of data as it is collected, classified and verified, and of the conclusions that can be drawn from it (Margoluis and Salafsky, 1998). Co-management implies that all the stakeholders are involved in data collection and the choice of indicators, but also that the results of monitoring are presented to internal and external audiences in order to share them.

Evaluation, based on the monitoring, should diagnose implementation problems, make adjustments and take the decisions transposed into the annual work plan and budget concerning the activities, the needs in term of resources and finance. Concerning the evaluation procedures for a management plan or project, there are several different approaches: i) performance evaluation, which aims to determine the extent to which goals and specific objectives have been achieved; ii) process evaluation, which examines how the goals and objectives were achieved; iii) results evaluation, which concerns the socio-economic and environmental impact of a co-management plan; iv) evaluation of the costs and benefits (Margoluis and Salafsky, 1998; Berkes et al, 2001). What is specific about evaluation in a co-management system is, on the one hand, the importance given to governance indicators, and, on the other hand, a participatory approach to evaluation which, through the feedback it creates, favours learning among all the stakeholders, including the institutions.

Point for consideration n° 10 ***Set up a monitoring & evaluation system geared towards co-management***

- Continuously collect the data required for filling in the selected co-management indicators;
- Carry out evaluations of performance, processes and results (socio-economic and environmental impacts), and lastly an evaluation of the costs and benefits;
- Diagnose the variances between actual activities and planned activities;
- Transpose into the annual work plan the adjustments decided on concerning the activities in respect of monitoring, and adapt the needs in resources and finance;
- Give preference to iteration (progress step by step) which facilitates the learning of co-management and the evaluation of the processes.

THE ADVANTAGE OF NETWORKING FOR CO-MANAGEMENT APPROACHES

Connecting the fishing community and its organisations to the other stakeholders external to the community through a network is critical for the success of co-management in the long term. This should help establish links by means of which the interests of the community can be taken into account, that provide a source of technical support, and for sharing experience and strategy. These links are forged with other communities and co-managed projects, NGOs and bilateral or multilateral technical support systems, government bodies, and people of influence such as women or politicians (Pomeroy and Rivera-Guieb, 2006).

3.6.5 Technical fisheries development measures that can be applied to co-management

The implementation of a co-management plan or project may draw on technical measures used in conventional fisheries development: the introduction of fishing licences, limitations relative to the fishing effort, such as the number of days or hours authorised, the seasonal or permanent closure of fishing grounds, restrictions concerning gear, catch quotas and total admissible catches (TAC), the distribution of the total admissible catches between participants in the fishery, individual fishing quotas (IFQ), whether transferable (ITQ) or not, or minimum size limits

on fish. However, the TAC and quotas, and even more so the ITQ, seem to pose a problem when it comes to artisanal multi-species fisheries in developing countries. We could mention, for example, the dispersion of the fishing units, the variety of fishing gear used, the collection of data on the stocks subject to quotas, the limited capacity of the managers, and equity considerations.

This implementation may also draw on traditional development measures that typically concern territorial usage rights to semi-open aquatic areas (lagoons) and are expressed as the seasonal or permanent closure of fishing grounds, prohibitions or restrictions on certain fishing techniques, or regulations on fishing effort (Weigel, 1985; Freeman et al, 1991). These measures may have a deliberate or incidental effect on the preservation of the fishing resources and the avoidance of conflicts over use, but their localised nature, empiricism and the ambiguity of their goals lead to a case-by-case analysis, prior to integrating them into the implementation of a co-management plan.

The implementation of a co-management plan or project may have an adverse effect on certain stakeholders, which poses the question of compensation associated with temporary measures (temporary exclusion, technical or biological stoppage) or definitive measures (decommissioning, destruction of fishing gear). However, the results of compensation can be disappointing (Holland et al, 1999; Clark et al, 2005) insofar as they may encourage irresponsible behaviour on the part of the players and lead to a "loss of the sense of fishing dialogue".

The difficulty in establishing this dialogue resides essentially in the possibility the stakeholders have of implementing new, restrictive measures in fisheries management during the transition period, whereas the benefits will only be felt later on. Some stakeholders may have to stop their activity without the possibility of diversifying in Alternative Livelihoods and Income Generating Activities (AL/IGA); others may not be able to accept a fall in income and prefer to refuse the measures, and remain in a deteriorated situation with an income that is low but guaranteed in the short term.

The technical measures relative to reducing overcapacity in artisanal fishing arouse interest related to the role that befalls the communities of artisan fishers in the implementation of co-management. The challenge of implementing co-management, in this case, is to facilitate the reduction of excess capacity (if overcapacity is the fishery problem) without causing unacceptable perturbations to

Box 9 Co-management and individual transferable quotas (ITQ)

Authors: David de Monbrison and Jean Yves Weigel (Additional information in the technical report)

adapted from Cléach M-P, (2008), Mongruel R. and Palsson G. (2004), Buisson G and Barley M. (2007) and Anderson L.G (2000)

Individual transferable quotas (ITQ) may appear to be effective tools for reducing capacities as a complement to or substitute for decommissioning schemes. They are sometimes promoted as the least expensive mechanisms for reducing fishing pressure and helping to achieve environmental resource management goals. Nonetheless, this type of tool does not systematically save on the costs of implementation (monitoring and controls) due to the need for close stock management. In highly industrialised, capital-intensive single species fisheries they become one management method among others. However, for multi-species artisanal fisheries they present a large number of limitations and risks in terms of concentration, external dependency and, on a socio-economic level, they could weaken a branch or a territory as a whole due to their impact on society. Information on the positive and negative effects and recommendations for counteracting the adverse effects of this management method are illustrated by the examples from the literature given in the technical report. The issues facing co-management in terms of ITQ are therefore to:

- measure the limits of these tools clearly and procure more contradictory insights as to their advantages and disadvantages,
- develop co-management agreements that make more room for fishing dialogue and the place of the fishers in decisions related to the management tools associated with the allocation of fishing rights,
- develop, in a concerted manner, new mechanisms that restrict the transferable aspect to prevent the phenomena of concentration and dependency,
- develop governance associated with the ITQ involving fisheries management functions and companion measures with robust financing (research, cooperation, surveillance) enabling adjustments.





society and the economy. This challenge points to the complex diversity of the types of fishing and fishers, the amplitude of fishing migrations, the high demographic growth rate, the dependency of fishers with respect to the resource, and the scarcity of alternative livelihoods to fishing (cf. technical report). It also points to the inflexibility and limited transferability of the production factors, the lack of a coordinated and integrated economic development approach between fishing and other sectors and the difficulties of implementing the “control, surveillance and enforcement” function (Pomeroy and Rivera-Guieb, 2006).

Reducing excess artisanal fishing capacity implies relating fisheries management measures to the socio-economic development of the communities and households of fisherfolk. The sustainable livelihoods approach offers such a perspective of linking fisheries management and socio-economic development, all the more so as it can only be implemented through a participatory approach like co-management (Chambers and Conway, 1992; Ashley and Carney, 1999).

3.6.6 The co-management of transboundary and transnational fisheries

Since the advent of the ecosystem approach, the scale of co-management can be extended to a transnational level, with cooperative management of shared stocks of fish which, for certain authors, become co-managed stocks. This explains why the management of certain transboundary, straddling or highly migratory stocks is sometimes classified as cooperative management. In the literature, it is essentially cooperative management or transnational co-management of transboundary stocks that has been developed.

The co-management of transboundary stocks has mainly been approached from the organisational, institutional, normative, legal and economic angle in detail in the technical report (Russell and van der Zwaag (2010), Burke, (1983) and van Houtte (2003), Björndal et al (2004), Munro, (1979); Sumaila et al (2002)). In general, two levels of cooperation are established: the first level relates to cooperation in terms of research which may be decisive if the research is independent; the second level rests in formulating a programme including an optimal long-term management strategy, the allocation of catch shares, and execution and enforcement methods.

Point for consideration n° 11

Clarify the limits, application framework and nature of the compensatory and companion measures associated with capacity reduction in a co-managed system

- Do not be naïve in terms of co-management: fishers and the players are jointly responsible for the situations and there are numerous ways of bypassing measures. Consider that the destruction of gear remains illusory, which can have numerous adverse effects in a system where control and surveillance are not optimal;
- Do not play a game of give and take: Aid is not made available in return for restrictive measures. Nonetheless, it is important to properly measure the negative impacts the communities must bear during the transition phase;
- In a crisis situation, take drastic measures to resolve a situation in two different ways relating to decommissioning:
 - i) exclude by directive, with compensation from the State (Europe);
 - ii) co-management of overcapacity with a concern for the adequacy of available stocks (example of scallops): This management requires highly effective control and surveillance by the State and the existence of exemplary sanction enforcement, highly responsive and accurate searching, the reduction of the exploitation periods adjusted to the resource and to the market (fishing periods, hours per day, etc.);
- Take into account the fact that the AL/IGA may be ineffective (temporary withdrawal from the effort, incentive to postpone effort, etc.) and give preference to fisheries dialogue and the responsibility of the players.

The institutional angle poses the question of the necessity of creating a specific body or of working with a straightforward, informal structure. The answer may be that this choice should be made depending on considerations of cost, sovereignty and effectiveness, which point to the complexity of the management problems to be resolved. In addition to the usual constraints related to national co-management, transboundary management combines additional difficulties such as the formal signing of international agreements, the coordination of national authorities and difficulties in harmonising.

Point for consideration n° 12 ***Test transboundary and transnational co-management experiences with caution***

- Build national governance and systems before developing transboundary or transnational co-management, which is necessarily more complex, particularly in terms of stock management, acquiring reliable bio-ecological and socio-economic data (research, monitoring);
- Draw on independent, impartial research;
- Promote long-term co-management, more particularly concerning technical measures. Integrate considerations of sustainable exploitation of the resources and give preference to an ecosystem-based approach;
- Analyse the legal, institutional and administrative constraints and develop and converge the corresponding framework to enable decisions and the signing of agreements relative to the management of stocks;
- Develop collaboration between the States in the sub-region in terms of measures and tools for the management of the stocks;
- Define responsibilities, adequate means and guarantee them at the level of the countries concerned;
- Adapt the institutional and administrative organisation to considerations of sovereignty, effectiveness and cost;
- Find the smallest common denominator before beginning the transition from national co-management to transboundary or transnational co-management, particularly regarding the definition of an agreed management target for the shared stock;
- Ensure transnational agreement on goals for stock and fisheries management so that the technical measures implemented on all sides do not cancel each other out at the level of a stock taken as a whole;
- Assess the costs and benefits of the different components of transboundary or transnational co-management;
- Promote the capacity of the Conference of Ministers of the SRFC to take binding decisions for implementing the necessary regional agreements.

3.6.7 The integration of fisheries co-management and a marine protected area

This section is a summary of the elements produced in the “Review of the State-of-the-art in the role of MPAs in fisheries management” also published by the SRFC in 2011 (cf. the corresponding technical and summary reports). Co-management has been recognised as the most efficient form of governance for both MPAs and for fisheries (Garcia et al, 2011). Integrating the co-management of a fishery and of an MPA nonetheless poses problems of adjustment, evaluation of joint positions and the fundamental differences to be accommodated after an objective analysis of the advantages and disadvantages. This requires the development of linkages between the different institutions at every scale, and represents a major challenge with innovative experimentation at institutional level.

An observation of fisheries and MPA management at the level of the sub-region shows a lack of consistency and synergy which is an obstacle to the design, formulation and implementation of co-management plans or projects:

- The legal, institutional and administrative framework of the fishing sector and the MPAs is rarely harmonised, and institutional linkages often entirely absent. Yet these connections are precisely what makes it possible to develop a higher national integration framework, identify a leading institution and clarify the roles and the distribution of tasks, to jointly define and develop co-management plans, and achieve economies of scale in spatialised management;
- The development of the co-management of a fishery or an MPA is often not harmonised, which makes arrangements more complex, in particular for the enforcement of regulations, monitoring and evaluation, control and surveillance;
- The management of migratory resources and the development of transnational networks are often not enough to decree the transboundary co-management of a fishery or an MPA;
- It is often not clear whether it is appropriate to create an MPA to resolve a problem related to fishing, or associated with a specific resource, rather than using other tools, which imply straightforward spatial or temporal restrictions on fishing;
- The necessity of regulating fishing capacity taking into account artisanal fishing is often not sufficiently emphasised prior to the creation of an MPA, in particular when migratory species are involved. Whatever the resources involved, the effectiveness of an MPA in relation to fisheries management in fact resides in effective control of the fishing capacity and effort.

Box 10 The Cote Bleue Marine Park. An MPA set up and managed with the fishers. Thirty years in existence (France)

Author: David de Monbrison, Elisabeth Tempier (additional information in the technical report)

When the modest Carry le Rouet reserve (85 ha) was created in 1983, at the initiative of Frédéric Bachet backed by the Provence-Alpes-Côte d'Azur Regional council, Marine Protected Areas were not in fashion, and only professional fishers concerned by the area showed their approval by supporting biological recovery, in the spirit of the tradition of the "prud'homies de pêche" dating back to the 14th century. Monitoring studies quickly confirmed the expected build up of stocks (reserve effect). As trawlers frequently crossed the coastal strip illegally, cooperation between fishers/managers/administration gradually turned into a real partnership, with the planting of anti-trawler posts, artificial production reefs and finally, a second reserve of 210 ha in 1996. Over the years, the management was strengthened through the involvement of the local authorities, the fishers and permanent members and results began to emerge with the colonisation of reefs multiplying biomass by 5, increasing appeal to tourists, and for fishers who came to set their nets on the edge of the MPA. Starting out with small resources, the MPA has gradually become a reference in the Mediterranean in thirty years.

Through this long-term partnership, the fishers have come to work more closely with the scientists, the administration and the local authorities; their organisations are strengthened by this, at least at local level, and they learn to negotiate with partners such as the Marseilles Port Authorities. In parallel to the intensification and increasing specialisation in fishing methods, the techniques and know-how of these "craft trades" and the wide variety of their catches which are sold direct to the customer, are an integral part of a cultural heritage which deserves to be recognised, promoted and extended. These points are today entrenched in the Park's management plan.

Point for consideration n° 13 Create synergy between co-managed fisheries and marine protected areas

- Create institutional linkages to establish a national integrating framework, identify a leading institution, jointly define and develop co-management plans;
- Harmonise the legal, institutional and administrative framework;
- Coordinate the development of the co-management of a fishery and of an MPA by simplifying the arrangements;
- Boost the management of migratory resources and develop transnational networks before decreeing transboundary co-management of a fishery or an MPA;
- Make sure it is appropriate to create an MPA to solve a problem of fishing or related to a specific resource, rather than implementing straightforward spatial and temporal restrictions;
- Regulate fishing capacity, including artisanal, prior to creating an MPA, particularly when migratory species are involved.

3.6.8 Applying co-management to artificial reefs and FADs

There are four main categories of artificial reef associated with the various present day goals (fishing and productivity, recreation, restoration of the environment and optimisation of coastal developments). Over the past few years, the concept of "artificial reef" has gradually been replacing that of "artificial habitat".

An analysis of artificial reef management in the experience of Senegal (Bargny and Yenne) brings to light the comparative advantages of a co-management system (Mbaye et al, 2008). Artificial reef co-management requires joint decisions, particularly in terms of use allocation. It also requires adaptive co-management, which is achieved through joint design and formulation, clear goals, financing of management, adaptable management rules defined upstream, and control and surveillance of rule enforcement.

Fish Aggregation Devices (FADs) differ significantly from artificial reefs since they are clearly defined not as tools for increasing natural productivity or improving local biodiversity, but as actual fishing gear targeting small or large pelagic fish. There are two major types of FAD, those anchored in deep waters and floating, at considerable cost (often used by large ocean seiners) and those anchored in shallow waters or near the coast (even if sometimes in deep waters), which are affordable to local or traditional fishers in terms of maintenance and can be co-managed.

In the SRFC region, Cape Verde is emblematic of the installation and management of FADs with the Maio and Pedra Badejo projects.

Observation of FAD management reveals a number of weaknesses (Rey-Valette et al. 2000) which can be explained by the following inadequacies: Irregular maintenance and renewal of the FAD, poor transfer of management to the professionals and lack of empowerment of the latter, poor integration or lack of institutional change in response to technological changes, irregular monitoring, and the absence of a legal framework.

☞ *The review of regional experiences in terms of the installation and management of FADs or artificial reefs indicates that:*

- *They should be part of integrated coastal management and sustainable fisheries management incorporating control of fishing effort and pressure;*
- *Their co-management presents the same conditionality and phases as an MPA, with an additional concern related to end of life and renewal of structural work (essential for FAD, sometimes necessary for artificial reefs).*



4 ANALYSIS AND SUMMARY OF INTERNATIONAL EXPERIENCES IN FISHERIES CO-MANAGEMENT

Eleven detailed “experience sheets” were produced in the “technical report” on co-managed fisheries, each pertaining to a different country, including examples from Europe, Asia, Africa and America (cf. map in section 1.3). All the experts who produced an analysis of a co-management experience have in-depth knowledge of the subject and country concerned, enabling a detailed analysis while at the same time following an identical model for each example.

The experiences analysed were selected according to several criteria, such as available hindsight on the process implemented, the exemplary nature of the case in question (Japanese co-management or the Mediterranean *prud’homies*, for instance), the illustrative nature of the scale of application of the co-management, whether local, national or transnational, the degree of success, and, lastly, the importance in terms of lessons that can be drawn for the SRFC area.

The analysis of eleven experiences made it possible to highlight the difficulties encountered, what worked well in the design and formulation or implementation, how the players found ways to adapt the sharing of responsibilities depending on how the situation and power relations were evolving and on the progress of the projects.

The Japanese experience confirms two conditions for success: (i) effective decentralisation at sector level, and (ii) the necessary building of community-based management. It also underscores the role of the State in creating a legal framework conducive to co-management and an institutional framework conducive to effective decentralisation, with the creation of multiple-scale organisations for coordinating the development of marine fisheries. Lastly, it emphasises the importance of the structuring of community-based management around the territorial use rights granted by the legislator, and the possibility of a co-management system changing scale, from fishery to ecosystem, for instance.

Thailand’s experience shows the necessary adaptation of co-management methods to the institutional framework of the country concerned, to the constraints and needs of the community concerned. It underlines the necessary revision of the legislative arsenal in order to recognise and affirm the fisheries co-management; the necessary clarification and definition of fishing rights on the scale of the community; the advantages of involving fishers in the collection and processing of data in collaboration with the scientists; the advantage of targeting achievable goals to obtain swift results and create an awareness of the benefits of commitment and effort.

📖 *Eleven “experience sheets” were analysed in depth and are presented:*

- *Sheet no. 1. An example of co-management institutionalised on a national scale: coastal fisheries in Japan.*
- *Sheet no. 2. A gradual adaptation of the co-management framework for artisanal fisheries: the example of the Thai fisheries*
- *Sheet no. 3. The concerted action of setting up a co-management process: The example of co-managed fisheries in the province of Aceh (Indonesia).*
- *Sheet no. 4. From legalisation to the legitimisation of co-management: The example of lake fisheries in Burkina Faso.*
- *Sheet no. 5. The co-management of local fisheries and protection of a stock – Rio Grande de Buba (Guinea Bissau).*
- *Sheet no. 6. The difficulties of co-management: The example of artisanal fisheries in Senegal.*
- *Sheet no. 7. Fisheries co-management and management plan implementation process. The example of the “Octopus Plan” (Mauritania).*
- *Sheet no. 8. Transboundary management of shared stocks of hake in the Benguela Current Large Marine Ecosystem.*
- *Sheet no. 9. Decentralized co-management withstands time and institutional change - the Prud’homies de pêche in the French Mediterranean*
- *Sheet no. 10. The development of co-managed artisanal-industrial fisheries: The example of mixed development zones (ZAC) in shrimp fisheries (Madagascar)*
- *Sheet no. 11. Fisheries co-management and surveillance/control of fishing activities (Canada and Benin)*

The fisheries co-management experience in Aceh province, Indonesia draws attention to the importance of negotiation and of four of its components; awareness raising, capacity building, action on the ground and networking. It confirms the necessity of explicit sharing of responsibilities among the stakeholders, and of the players in the co-management assuming ownership of the different phases. The example stresses the necessity of adapting co-management arrangements as the situation and needs evolve, but also of placing fisheries co-management in the broader context of the ecosystem and the local economy.

The experience of Burkina Faso bring to light the necessity of an adaptable legal co-management framework in the form of laws, decrees, orders and specifications documents; the necessity for completed institutionalisation with recognised centrality and a detailed remit for the management committees; the achieving of the goal of legitimisation integrating the oral tradition and custom, beyond the simple legalisation of co-management; the advantages of restricting the co-management unit since this restriction favours legitimisation by the stakeholders.

The experience of Guinea Bissau in the co-management of Rio Grande de Buba fisheries reveals: The advantages of leadership for formulating a management plan; the importance of local facilitators and the involvement of associations in surveillance; lastly, the possibility of replicating the experience on condition that the ecosystem and fishing community are comparable. It also shows how it is easier to set up co-management in a small, circumscribed territory and how co-management can be used to define rules for restricting territorial use.

The experience of Senegal confirms that donor support must be continuous, in order to consolidate pilot experiences, since throughout the projects we find a focus on certain sites; that the support of the population is evident in the sites where the co-management was set up with substantial and continuous means; that organising the co-management players in occupational groups or by territory may gain the support of the population concerned. The difficulties of the Senegalese experience led to the proposal of a series of recommendations including: Harmonise the legislation governing fishing with that of decentralisation; formulate a co-management strategy document; define the application criteria and mechanisms and clarify the interactions between them to lighten the administrative procedures; formulate a suitable communication policy oriented towards all the players concerned and the territorial administrations; enable the co-management body (in Senegal, the Local artisanal fisheries committees) to collect taxes and contributions.

The experience of the octopus management plan in Mauritania shows how initial objectives can be insufficiently appropriate and how the different institutions are mobilised to a greater or lesser degree. This example above all shows how, in the implementation of a management plan, the institutional function (definition of the legal and institutional frameworks, definition and distribution of roles, assuming of responsibility and policy orientations, and allocation of financial resources) is important and makes or breaks the implementation of binding measures. It also shows the importance of synergies between the different institutions.

The experience of cooperative transboundary co-management of shared stocks of hake in the Benguela Current Large Marine Ecosystem shows the advantages of signing a Fisheries Protocol explicitly binding on all the States concerned; and progressive implementation of co-management with respect to the difficulties to be smoothed over (diversity of institutions and management methods, the absence of real regional procedures for managing transboundary stocks).

The experience of the *prud'homies* in the French Mediterranean highlights how fishers were able to maintain links with the preservation of the quality of the fishing grounds and sustain a small, diversified fishery and the oral transmission of the traditional *prud'homies* culture. The *prud'homies* enabled the integration of immigrant fishers from a variety of backgrounds, a certain degree of involvement in coastal management and the life of the community, the initiation of actions such as the creation of reserves, structuring (*prud'homie* collectives, *prud'homie* members elected to the fisheries committees) and recognition from the local authorities. Lastly, they enabled good practices to be maintained in terms of local co-management and surveillance arrangements. This example shows how, over the years, a decentralized co-management organisation can deal with different political influences, cultural change and technological advances. It brings to light the foundations on which decisions, processes, difficulties and successes are based to maintain the system in a context of a reduction in the numbers of fishing jobs and institutional change.

Madagascar's experience of mixed development zones combining artisan fishers and industrial fishers around shrimp resources places emphasis on the setting up of consultation bodies and methods; the formulation of "development contracts" authorising validation at the level of the regional, then national, bodies, within which the competent administration is represented; lastly the realisation of concrete action likely to contribute in the short or medium term to a better management of the resource,

the consolidation of consultation, and the sustainable development of the pilot zones. This example stresses the timing difficulties involved in short-term projects associated with the implementation of long-term processes. It also shows an example of an approach in a context of co-management of artisanal and industrial fishing of the same resource. This example specifies the importance of step-by-step support enabling collective learning through the implementation of decentralised co-management bodies. It also shows the advantages of creating a co-management area with boundaries that favour the anchorage of the stakeholders in a perimeter that is easily identifiable by all.

The Canadian experience of co-management of surveillance and control shows the importance of having a legal framework prior to the introduction of new co-management methods associated with industrial fishing. It also shows an innovative surveillance funding mechanism by the fishers in support of State surveillance actions and the factors leading to the maintaining or weakening of the mechanism.

The experience of Benin in fisheries surveillance specifies the limits and the importance of mobilising the players in programmes to combat illegal fishing and the overexploitation of the resources to make up for the weakness of State-run surveillance programmes. It highlights the precautions to be taken and the recommendations for implementing co-management that involves fishers in surveillance.



5

MAIN BIBLIOGRAPHY REFERENCES

- Acheson, J. 1989. Management of common property resources. In: *Economic Anthropology*, Ed. S. Plattner, 351-378. Stanford University Press.
- Anderson L.G (2000). Selection of property rights management system in R. Shotton (ed). Use of property rights in fisheries management, FAO fisheries Technical paper, N° 404/1, p 26-38.
- Allison, E.H. and F. Ellis. 2001. The livelihoods approach and management of small-scale fisheries. *Marine Policy*, 25: 377-388
- Allison, E.H. and B. Horemans. 2006. Putting the principles of the Sustainable Livelihoods Approach into fisheries development and practice. *Marine Policy*, 30: 757-766
- Amblard, L., O. Aznar et C. Mann, C. 2008. La méthode PICA ou comment évaluer la cohérence des politiques publiques avec leur contexte de mise en œuvre, *Ingénieries-EAT*, 54 : 79-82.
- Ashley, C and Carney, D. 1999. Sustainable livelihoods: lessons from early experience. London, DFID.
- Baran, E. et Ph. Tous. 2000. Pêche artisanale, développement et cogestion durables des ressources: Analyse d'un succès en Afrique de l'Ouest. UICN, Bureau national de la Guinée-Bissau, 2000: 44p.
- Bavink, M., R. Chuenpagdee, R., M. Diallo, M., P. van der Hijden, J. Kooiman, J., R. Mahon and S. Williams. 2005. Interactive fisheries governance: a guide to better practice. Mare. Amsterdam: 72 p.
- Belal, E. et M.O. Baba. 2006. La cogestion des pêches au Cameroun : une analyse des politiques qui la sous-tendent. MINEPIA/DIRPEC. Ministère de l'Elevage, des Pêches et des Industries Animales. Direction des Pêches et de l'Aquaculture, Yaoundé, Cameroun, avril 2006 : 40p.
- Berkes, F. 1994. Property rights and coastal fisheries. In: *Community management and common property of coastal fisheries in Asia and the Pacific: Concepts, methods and experiences*, Ed. R.S. Pomeroy. ICLARM Conf. Proc. 45. Manila: ICLARM.
- Berkes, F. 1997. New and Not-So-New. Directions in the Use of Commons: Co-Management. *The Common Property Resource Digest*. July, 1997. pp. 5-7
- Berkes, F., R. Mahon, P. McConey, P., R. Pollnac and R.S. Pomeroy (Eds). 2001. Managing small scale fisheries. Alternative directions and methods. Stylus publishing LLC : 250 p.
- Bigombe L. 2002. L'Apprentissage par l'action de la cogestion des ressources halieutiques au Cameroun (Rapport de l'atelier de formation à la cogestion de la Retenue de la Mape, Yaoundé, UCN-MINEPIA, mars 2002, 40 pages.
- Bjørndal, T., D. Gordon, V. Kaitala and M. Lindroos (2004). International management strategies for a straddling fish stock: a bio-economic simulation model of the Norwegian spring-spawning herring fishery. *Environmental and Resource Economics* 29, 435-457. [Compares several possible management options for herring using a discrete-time age-structured dynamic bioeconomic model.]
- Boncoeur J. (2008) « Effets potentiels des récifs artificiels sur l'activité halieutique selon la nature des installations et le régime de régulation de l'accès : une analyse bioéconomique simple » conférence invitée au symposium international « La gestion des récifs artificiels pour l'aménagement des pêches et la conservation des ressources marines », 11-14 novembre 2008, Dakar.
- Borrini Feyerabend, G., Farvar, M. T., Nguingiri, J.-C. & Ndangang, V. 2000. La gestion participative des ressources naturelles. Organisation, négociation et apprentissage par l'action. — Heidelberg, Kasperek Verlag, GTZ et UICN.
- Borrini-Feyerabend, G., M. Pimbert, M.T. Farvar, A. Kothari, A. and Y. Renard. 2004. Sharing Power. Learning by doing in co-management of natural resources throughout the world. IIED and IUCN/CEESP/CMWG, Cenesta, Tehran, 2004: 456p.
- Borrini-Feyerabend, G., C. Chatelain, G. Hosh et al. 2010. En Gouvernance Partagée ! Un guide pratique pour les aires marines protégées en Afrique de l'Ouest, PRCM, UICN et CEESP, Dakar : 88 p.
- Bousquet F. and Voinov A. (eds), 2010. Thematic Issue - Modelling with Stakeholders. *Environmental Modelling & Software*, 25: 11, 1267-1488
- Buisson G., Barley M. 2007. Les quotas individuels de pêche transférables – Bilan et perspectives pour une gestion durable des ressources. (Min. Environnement Durable français). 57p
- Burke, W.T. 1983. 1982 Convention of the Law of the Sea Provisions on Conditions of Access to Fisheries Subject to National Jurisdiction, in FAO, Report of the Expert Consultation on the Conditions of Access to the Fish Resources of the Exclusive Economic Zone, Rome, 11-15 April 1983, FAO Fisheries Report No 293, Rome : 23-42

Caddy, J.F. 1997. Establishing a consultative mechanism or arrangement for managing shared stocks within the jurisdiction of contiguous states. In D. Hancock (Ed) Taking stock: defining and managing shared resources, p.81-123. Sydney, Australie, Australian Society for Fish Biology.

Carlsson, L. and F. Berkes. 2005. Co-management: concepts and methodological implications. *Journal of Environmental Management* (2005) 75 : 65-76.

Cazalet, B. 2007. La reconfiguration de la gouvernance et des politiques publiques. In Les aires marines protégées ouest-africaines. Gouvernance et politiques publiques. Weigel J.Y., Féral, F., B. Cazalet (Eds). PUP.

Chambers, R. & G. Conway. 1992. Sustainable rural livelihoods: Practical concepts for the 21st century. IDS, document de travail no296. Brighton: IDS

Chauveau, J.-P., E. Jul-Larsen et C. Chaboud. (Eds.), 2000. Les pêches piroguères en Afrique de l'Ouest. Pouvoirs, mobilités marchés, Paris, IRD – Ch. Michelsen Institute

Clark, C.W, G.R. Munro, U.R. Sumaila. 2005. Subsidies, buybacks, and sustainable fisheries. *Journal of Environmental Economics and Management*. Volume 50, Issue 1, July 2005.

Cléach M-P. 2008 - l'apport de la recherche à l'évaluation des ressources halieutiques et à la gestion des pêches, - 2008- Commission de l'office parlementaire d'évaluation des choix scientifiques et technologiques de l'évaluation de l'assemblée nationale française. 173 pp

Collectif ComMod (2009). La posture d'accompagnement des processus de prise de décision : les références et les questions transdisciplinaires, in: Modélisation de l'environnement : entre natures et sociétés (D. Hervé, F. Laloé, eds.), Quae, NSS.

CSRP. 2007a. Projet sur les politiques régionales pour une pêche durable des petits pélagiques en Afrique Nord Ouest. Maroc et Etats de la CSRP. Atelier de démarrage, Dakar 29-31 octobre 2007.

DENR. 2001., Philippine Coastal Management Guidebook No. 3: Coastal Resource Management Planning. Coastal Resource Management Project of the Department of Environment and Natural Resources. Department of Agriculture, and Department of the Interior and Local Government. Department of Agriculture, and Department of the Interior and Local Government. 2001. Cebu City, Philippines.

Dietz T., Ostrom E. and P.C. Stern. 2003. The struggle to govern the Commons. *Science*, Vol 302 n°5652 pp.1907-1912.

Fargier, L. 2012. La participation des pêcheurs artisanaux à la gestion des ressources marine côtières tropicales. Etude de cas dans le Golfo Duce, Costa Rica. Thèse de doctorat en sciences de l'environnement. Université de La Rochelle. 583 pages.

Feeny, D., F. Berkes, B. McCay, and J. Acheson. 1990. The tragedy of the commons: Twenty-two years later. *Human Ecology* 18 (1): 1-19.

Féral, F. 2001. Sociétés Maritimes, Droits et Institutions des Pêches en Méditerranée Occidentale. *Revue Synthétique des Droits Collectifs et des Systèmes Décentralisés de Discipline Professionnelle*. FAO Document technique sur les pêches. N°420. FAO, Rome.

Féral, F. et B. Cazalet. 2007. Le cadre juridique de la gouvernance : un système de droit synchrétique. In Les aires marines protégées ouest-africaines. Gouvernance et politiques publiques. Weigel J.Y., Féral, F., B. Cazalet (Eds). PUP.

Fisheries Research and Development Corporation. 2008. Co-management : managing Australia's fisheries through partnership and delegation. Australian Government. 34p.

FAO. 1995. Code de conduite pour une pêche responsable. Rome, FAO. 1995. 46p.

Freeman, M.M.R., Y. Matsuda and K. Ruddle (eds) 1991. Adaptive marine resource management systems in the Pacific. *Resource Management and Optimization* 8, 127-245.

Garcia, S.M. 2011. Etude sur l'état de l'art du rôle des aires marines protégées dans la gestion des pêches. Rapport technique : Introduction et « Volet gouvernance ». CSRP. 358p.

Garcia, S.M., D. Gascuel, L-M. Hénichart, J. Boncoeur, F. Alban, F. et D. (de) Monbrison (de), D. 2011. Etude sur l'état de l'art du rôle des AMP dans la gestion des pêches. Elément de réflexion pour la CSRP et ses partenaires. Edition : CSRP. Décembre 2011 : 34p.

Gulland, J.A. 1980. Some Problems of the Management of Shared Stocks, FAO Fisheries Technical Paper No 206, Rome.

Gutierrez, R.H., R. Hilborn and O. Defeo. 2011. Leadership, social capital and incentives promote successful fisheries. *Nature Letter*. Nature, vol 470, 17 February 2011: 386-389 Doi: 10.1038/nature09689

Hanna, S. 1995. User participation and fishery management performance withing the Pacific Fishery Management Council. *Ocean and Coastal Management*, 28 (1-3): 23-44

Holland, D., Gudmundsson, E. and Gates, J. 1999, 'Do fishing vessel buyback programs work: a survey of the evidence', *Marine Policy*, vol. 23, pp. 47-69.

Hufty M, Dormeier Freire A, Plagnat P & Neumann V. 2007. Jeux de gouvernance. Regards et réflexions sur un concept. Paris Karthala-IUED. 242 p.



- Jentoft, S. 1989. Fisheries co-management: Delegating government responsibility to fishermen's organizations. *Marine Policy* 13(2): 137-154.
- Jentoft, S. and T. Kristofferson. 1998. Fishermen's co-management: The case of the Lofoten fishery. *Human Organization* 48 (4): 355-65
- Jentoft, S., B. McCay and D.C. Wilson. 1998. Social theory and fisheries co-management. *Marine Policy*, vol.22, no. 4/5, 1998: 423-436
- Kearney, J.F. 1984. Atlantic fisheries, coastal communities: fisheries decision—making case studies. In: Lamson C, Hanson AJ, editors. *Dalhousie Ocean Studies Programme. Institute for Research and Environmental Studies*, Halifax, 1984. p. 165–204.
- Margoluis, R. and N. Salafsky. 1998. *Measures of Success: Designing, Managing and Monitoring Conservation and Development Projects*. Island Press, Washington, DC.
- Mbaye, L. C. Escaravage, A.B. Sy, H. Bru, L. Kinadjian (Ed.sc.); 2008. La gestion des récifs artificiels pour l'aménagement des pêches et la conservation des ressources marines. Actes du Colloque international, Dakar, 11-14 novembre 2008. Ministère de l'économie maritime, de la pêche et des transports maritimes.
- McCann, L., B. Colby, W.K. Easter, W.K., A. Kasterine and K. Kuperan Viswanathan. 2005. Transaction cost measurement for evaluating environmental policies. *Ecological Economics* 52 (2005): 527-542
- McCay, B.J. 1993. Management Regimes. Property Rights and the Performance of Natural Resources Systems, background paper prepared for the September 1993 Workshop, The Beijer International Institute of Ecological Economics, 1993.
- McGoodwin, J. 1992. The case of co-operative co-management. *Australian Fisheries* May: 11-15.
- Ministère de l'Economie Maritime (MEM) - PRAO. 2011. Rapport d'Evaluation des Conseils Locaux de Pêche Artisanale (CLPA). Direction des Pêches Maritimes /PRAO. 54 pages.
- Ministry of Fisheries, Water Ressources and National Assembly Matters. Republic of Gambia. 2012. Fishery Co-Management Plan For The Gambia Sole Complex (focus on artisanal fisheries sub-sector). January 2012: 46p.
- Mongruel R., Palsson G. 2004. Le propriétaire l'exploitant, le salarié, l'exclu : les conséquences sociales de la gestion des pêches par des systèmes de marché de droits. *Tiers-Monde* (ed.). tome 45 n° 177. pp. 29-60
- Munro, G. 1979. The Optimal Management of Transboundary Renewable Resources, *Canadian Journal of Economics* 3: 271-296
- Oakerson, R.J. 1992. "Analysing the commons: a framework", dans *Making the commons work*, sous la direction de Bromley, D. ICS Press, San Francisco. (Californie, E-U.).
- OECD. 1996. Synthesis report for the study on the economic aspects of the management of marine living resources. OECD, Paris.
- OECD. 1997. Towards Sustainable Fisheries: Country Reports. OCDE/GD (97) 119. Paris.
- Olsson, P., C. Folke, and T. Hahn. 2004. Social-ecological transformation for ecosystem management: the development of adaptive co-management of a wetland landscape in southern Sweden. *Ecology and Society* 9(4): 2.
- Oposa, A.A. 1996. Legal marketing of environmental law. *Duke Journal of Comparative and International Law* 6, 273–291.
- Ostrom, E. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge, UK.
- Ostrom, E. 1994. Institutional analysis, design principles and threats to sustainable community governance and management of commons. In: R.S. Pomeroy (Ed.) *Community management and common property of coastal fisheries in Asia and the Pacific: concepts, methods and experiences*. ICLARM Conference Proceedings 45. pp. 34-50. ICLARM, Manila, Philippines.
- Pinkerton, E. (Ed.), 1989. *Cooperative Management of Local Fisheries, New Directions for Improved, Management and Community Development*. University of British Columbia Press, Vancouver.
- Pinkerton, E. 2007. Integrating Holism and Segmentalism: Overcoming Barriers to Adaptive Co-Management Between Management Agencies and Multi-Sector Bodies. In: Armitage, D.; Berkes, F.; Doubleday, N. (Eds) *Adaptive Co-management: Collaborative Learning and Multi-level Governance*. Vancouver, BC: University of British Columbia Press: 151-171
- Plummer, R., and D. R. Armitage 2007. Charting the new territory of adaptive co-management: a Delphi study. *Ecology and Society* 12(2): 10.
- Pomeroy, R.S. and F. Berkes. 1997. Two to tango : The role of government in fisheries co-management. *Marine Policy* 21 (5) : 465-480
- Pomeroy, R.S., B.M. Katon and I. Harks. 2001. Conditions affecting the success of fisheries co-management: lessons from Asia. *Marine Policy* 25: 197-208.
- Pomeroy, R.S. and T. Goetze. 2003. Belize case study: Marine protected areas co-management by Friends of Nature. Annex B (IV) of the Final Technical Report of project R8134 (DFID). Caribbean Conservation Association. 2003: 64p.
- Pomeroy, R.S., P. McConney and R. Mahon. 2004b. Comparative analysis of coastal resource co-management in the Caribbean. *Ocean & Coastal Management*, vol .47, no.9, 2004: 429-447.

Pomeroy, R.S. and R. Rivera-Guieb. 2006. Fishery co-management : a practical handbook. CABI Publishing, Cambridge, USA in association with the International Development Research Centre, Ottawa, Canada : 264p.

Pomeroy R.S. and N.L. Andrew. 2011. Small-Scale Fisheries management : Frameworks and Approaches for the Developing World. CABI.

Raakjaer Nielsen, J. and S. Sverdrup-Jensen. 1999. Summary of African Experiences. The International Workshop on Fisheries Co-Management, Penang, Malaysia, 23-28 August.

Raakjaer Nielsen, J., P. Degnbol, K. Kuperan Viswanathan and M. Ahmed. 2002. Fisheries Co-management. An Institutional innovation. Perspectives and Challenges Ahead. Paper presented at IIFET 2002, Wellington, New Zealand & 9-22 August, 2002.

Raakjaer Nielsen, J., P. Degnbol, K. Kuperan Viswanathan, M. Ahmed, M. Hara and N.M.R. Abdullah. 2004. Fisheries co-management – an institutional innovation? Lessons from South East Asia and Southern Africa. *Marine Policy* (2004) 28: 151 – 160

Rey-Valette H., Cillaurren E., David G. 2000. Évaluation pluridisciplinaire de la durabilité des pêcheries artisanales autour-des dispositifs de concentration de poissons. *Aquatic Living Resource*. 13(2000)241-2520 2000

Russel, D.A. and D.L. van der Zwaag. (Eds). 2010. Recasting Transboundary Fisheries Management Arrangements in Light of Sustainability Principles: Canadian and International Perspectives. Martinus Nijhoff Publishers, 31 oct. 2010: 544p.

Sen, S., and J. Raakjaer Nielsen. 1996. Fisheries co-management: a comparative analysis. *Marine Policy* 20 (5): 405-418.

Singleton, S. 1998. Constructing Cooperation: The evolution of Institutions of Co-management. Ann Arbor, University of Michigan Press.

Staples, D. & Funge-Smith, S. (2009) Ecosystem approach to fisheries and aquaculture: Implementing the FAO Code of Conduct for Responsible Fisheries. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand. RAP Publication 2009/11, 48 pp.

Sumaila, U.R., MC. Ninnes and B. Oelofsen. 2002. Management of shared hake stocks in the Benguela Marine Ecosystem. In Norway-FAO expert consultation on the management of shared fish stocks. Bergen, Norway, 7-10 October 2002. FAO Fisheries Report No. 695, Supplement FIPP/R695 (Suppl.)

Tempier, E. 1986. Prud'homie et régulation de l'effort de pêche. CRPEE Economie méridionale, nos 1 et 2, Montpellier, France.

Tobey, J. Castro, K., V. Lee, O. Drammeh, O., I. Mat Dia, B. Crawford and T. Vaidyanathan. 2009. An Overview of Marine Fisheries in the Gambia and preliminary Governance Baseline. Coastal Resources Center, University of Rhode Island: 26p.

Van Houtte, A. 2003. Legal Aspects in the Management of Shared Fish Stocks : A Review, in FAO, Papers Presented at the Norway – FAO Expert Consultation on the Management of Shared Fish Stocks, Bergen, Norway, 7-10 October 2002, FAO Fisheries Report No 695 Supplement, Rome : 30-42.

Verhaegen, I. and G. van Huylenbroeck. 2002. Hybrid governance structures for quality farm products: A transaction cost perspective. Shaker Verlag, Aachen.

Viswanathan, K., N.M.R. Abdullah, R.S. Pomeroy, E.L. Genio and A.M. Salamanca. 2008. Mesuring Transaction Costs of Fisheries Co-Management. *Coastal Management Journal*, 36 (3): 225-240. DOI: 10.1080/08920750701681991

Voinov, A. and Francois Bousquet (2010). Modelling with stakeholders. *Environmental Modelling & Software*. P. 1268-1281

Watanuki, N. 2007. Manuel de congestion des pêcheries : Des théories et des études de cas au Japon, aux Philippines et au Sénégal. GIR-MaC/Côme-Pêche. Dakar, Février 2007: 28p.

Weigel, J.Y. 2011. De la gestion des pêches à la cogestion et à la gouvernance. Document de travail 4.7. Projet AMPHORE.

Weigel, J.Y., F. Féral, F. et B. Cazalet. (Eds.) 2007. Les aires marines protégées d'Afrique de l'Ouest. Gouvernance et politiques publiques. Perpignan : Presses Universitaires de Perpignan. 232p.

Weigel, J.Y., F. Féral and B. Cazalet. 2011. Governance of marine protected areas in the least developed countries. FAO Fisheries and Aquaculture Technical Paper, N°548, FAO Rome, 77p.

Weigel, J.Y. 1985. Traditional management of some lagoons of the Gulf of Guinea. In Fisheries Circular. N°790, September 1985. Fao, Rome. 32 p.

Williamson, O.E. 1998. Transaction Cost Economics: 'How It Works, Where It Is Headed'. *The Economist*, 146 (January), 23-58.

Worrapimphong, K. et al, 2010. A companion modeling approach applied to fishery management. *Environmental Modelling & Software*. 1334-1344.





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SRFC Permanent Secretariat

Villa 4430, Karack, rue KA-38
Dakar - Sénégal

Mailing address

POB 25485, Dakar - Fann, Sénégal
Phone: +221 33 864 04 75
Fax: +221 33 864 04 77

*spcsrp@spcsrp.com
www.spcsrp.org*

